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ON THE PATHOLOGICAL CONDITION OF THE BLOOD IN CHOLERA.

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THE author of the following paper feels some hesitation in publishing the analyses, which he has had the opportunity of making, as to the condition of the Blood in Cholera, but has been induced to do so for the following reason: that at the present time it is exceedingly doubtful whether the disease is likely to disappear altogether from this country, or whether the cases, which have already occurred in London, are only the forerunners of a much more severe visitation. If the former should fortunately be the case, the results of the investigations, unless quickly published, would soon lose their interest; if the latter, their being made known may elicit further inquiry into the subject, and hence be a means of causing the important changes, which the blood undergoes in this affection, to be much more satisfactorily determined. His hesitation arises from the analyses having been by no means so numerous or satisfactory as he could wish, on account of the great difficulties which have been experienced in London, during the present epidemic, in procuring blood from Cholera patients when alive. Hence, he has been compelled to make use of that obtained at post-mortem examinations—a proceeding by no means so satisfactory, on account of the probability of partial coagulation having taken place in the vessels, and therefore of the blood not being obtained in its entire state; that is to say, in some cases an undue proportion of the serum, in others, of the cruor, being procured. Frequently also, it is impossible, in such blood, to separate a quantity of serum sufficient for analysis; and therefore, in many cases, the most important portion of the blood cannot be properly examined. As many valuable investigations of the blood in Cholera were made during the last epidemic (1831-32), it may not be uninteresting to the reader, at the present time, to be enabled shortly to survey the results then obtained, and find in what points they agree, and in what they differ, from those recently observed.

With all the attendant difficulties, however, I think we shall be able to demonstrate, that our knowledge of the pathological changes of the blood in Cholera is as perfect as in any other disease, and that, which certainly must be considered as an important fact, we shall be able to solve the following problem. Given, *a specimen of human blood*:— determine *whether it was derived from a Cholera patient.* If we can effect this, it certainly must be allowed, that our knowledge of the blood in Cholera, although confessedly imperfect, far surpasses that in most other affections.

In reviewing the facts which have been well made out, concerning the morbid conditions of the human blood, we shall find, that although much which is exceedingly important has been established, yet that very much still remains to be effected; and that the diseases, in which a pathognomonic condition has been discovered, are very few in number. Among these, we may enumerate inflammatory affections, characterized by the constant increase of the amount of the fibrine; anæmic conditions of the system, by the diminution of the amount of the blood corpuscles; certain affections of the kidneys, by the great diminution of the albumen of the serum, and, at the same time, an accumulation of urea in the blood; gout, by the existence of uric acid in the blood; diabetes, by the presence of sugar; and icterus, by the colouring principle of the bile being found in the circulating fluid. These are the most important facts that we possess on the subject, and, it will be observed, that some, even of these changes, only indicate general conditions of the system, and will not enable us to form an opinion as to the individual organ affected; thus we find, as far as our analyses will enable us to judge, the same state of blood in pneumonia, pleuritis, peritonitis, acute rheumatism, etc., although no doubt many important differences really exist; at present, we only have the power of ascertaining that inflammation is going on somewhere in the system, and of judging of the structures affected, or of the intensity of that inflammation, by the amount of increase which the fibrine has experienced. Again, from an examination of the blood, we cannot determine from whence an anæmic condition of that fluid proceeds, whether it arises from loss of blood, from bad nutrition, chlorosis, the poison of lead, etc. Taking, then, into consideration how extremely imperfect is the knowledge we possess of the pathology of blood in general, I think we must allow, that should we be able to define a condition of this fluid which is pathognomonic of Cholera, a very important step has been attained.

We shall divide our subject into two parts. The first will contain a short account of the results which were obtained during the former epidemic of Cholera in Europe; the second will treat of the analyses recently performed.

I. CHEMICAL EXAMINATION OF THE BLOOD IN CHOLERA, PREVIOUS TO THE PRESENT EPIDEMIC.

During the years 1831 and 1832, the most active and successful investigators of the chemical pathology of Cholera were, Dr. O'Shaughnessy, Dr. Thomson, and Dr. Clanny, in this country; and on the Continent, MM. Lecanu, Hermann, Rose, and Wittstock. As far as physical characters are concerned, it had been often observed that, in Cholera

patients, the blood drawn during life, and, also that found in the large vessels after death, exhibited a condition differing from that seen in a state of health, or after death, from most other causes. On this point Dr. Ainsley observes, that he always found the large veins, both of the general and portal system, the sinuses of the brain, and the right cavities of the heart, loaded with a *thick, viscid, and black blood;* and when blood was found in the left cavities of the heart, it had a similar appearance. The lungs, and all the internal viscera, presented a greater or less degree of congestion from *pitchy* or *black blood*. Dr. Ainsley also states, that the blood exhibited morbid appearances, even when drawn from the patient at an early period of the disease; and as this advanced to a fatal issue, the characters above described were most manifest. He also considers this state of blood as one of the earliest links in the chain of effects, consequent on the invasion of the efficient causes of the disease, and a strong diagnostic mark. A similar appearance of the blood has been remarked by many others. Lecanu analysed the blood of four patients suffering from Cholera, with a view of discovering the amount of solid matter and water contained in it, and he found—

	1st Case.	2nd Case.	3rd Case.	4th Case.
Water	660	749	480	670
Solids	340	251	520	330
	1000	1000	1000	1000

Now the mean of ten analyses, made by the same observer, of healthy venous blood, taken from individuals from twenty-six to sixty-two years of age, gave in round numbers—

Water	789
Solids	211
	1000

It thus appears, that the watery portion of the blood is very deficient, the solids in one case being nearly double the amount found in health. The fibrine was deficient in quantity, and the blood corpuscles were increased in number.

Wittstock found, in a case of Cholera, that the blood was healthy in appearance, the clot of a scarlet red colour on the surface, but darker than usual in the interior. The serum had a specific gravity of 1038·5, and in 1000 parts contained 137·5 of solid matters.

1000 parts of blood gave—

Water	740·00
Solids	260·00
Blood corpuscles	124·46
Fibrine	11·00
Albumen	110·42
Extractives and Salts	14·10

The fibrine in this analysis was undoubtedly estimated far too high, for 11 parts of this proximate principle cannot exist in the 1000 parts of blood without causing a decidedly abnormal appearance, which, as stated above, was not observed; and many other instances are on record, as in Dr. Clanny's analyses, where the fibrine was only washed and pressed, but not thoroughly dried, and, consequently, the figure in the

table increased four or five fold. It will be seen that the specific gravity of the serum is greatly above the normal average, (which may be taken as 1028, water being 1000); and I may mention here, that an increase of 10 parts in the 1000 in the specific gravity of the serum is an alteration of the gravest importance, for this portion of the blood remains remarkably fixed in the proportion of its normal constituents, and a notable increase or decrease is not induced, except by the presence of deep-seated and dangerous disease. The total amount of solids in the blood is seen in this case to be much larger than in health, which, as mentioned above, were found by Lecanu to be about 211 parts in the 1000; this was due, in a great measure, to the large proportion of albumen, for 110 parts were contained in the 1000 of blood, in place of 69 parts, the mean amount in health. The red corpuscles appear to have been in about the usual quantity; the extractives and salts were estimated together, and with them the fatty matters were probably included, so that little can be made out concerning them.

M. Hermann, of Moscow, made an analysis of the blood, taken a few hours before death, from a man suffering from Cholera, and found it of a very viscid consistence, and dark in colour. The proportion of crassamentum to serum was as 60 to 40; whereas in health, the relation is about 43 to 57; thus indicating a considerable deficiency in the watery portion of the blood. The serum was alkaline, of specific gravity 1036. The crassamentum is stated to have been acid in reaction.

In the *Gazette Médicale de Paris* (Jan. 14, 1832) are contained the results of the analyses of Cholera blood, made by MM. Rose and Wittstock of Berlin, which are thus stated:

"MM. Rose and Wittstock have communicated to us the results of their experiments on the blood of persons labouring under Cholera. Despite of all the exactitude of their researches, they could not find the acid character of the blood, which M. Hermann asserted to exist. They have observed, that when the blood contained in the right ventricle of the heart of the Cholera patient is dried with great care, 30 parts per cent. of solid matter are invariably obtained; while, in the state of health, the blood only affords 21 per cent. This morbid proportion has been constantly found, as well in the blood of children as of old persons; neither did sex occasion any difference in the results. The serum of the blood of a young man, ætat. 20, who died of intense Cholera, was of specific gravity 1047, and afforded, when dried, 16 parts per cent. of solid matter. In a young woman, in good health, MM. Rose and Wittstock found the specific gravity 1028, and the serum only contained 9½ per cent. of solid matter. The dejections were strongly alkaline, and contained albumen. These experiments, frequently repeated at the Cholera Hospitals of Berlin, have invariably been attended with the same results."

We have now to speak of the researches of Dr. O'Shaughnessy, which are far more extensive and elaborate than those already detailed; he adopted the method then recently proposed by Lecanu, and used his analysis of healthy blood and serum as standards of comparison. His results are contained in a *Report on the Chemical Pathology of Malignant Cholera*, 1832. The analyses there published contain also some account of the patients from whom the blood was derived; and I will make

extracts from the pamphlet, as it is very important to know the condition of the patient at the time the blood is obtained.[1]

"Case I. *Malignant Cholera.* Mrs. Barras, æt. 39, widow, of excellent habits, good general health, in rather comfortable circumstances, and residing in a lane adjoining the river, Sandgate, Newcastle, was seized with cramps, epigastric pain, and giddiness, at about 10 p. m., on the night of the 17th December. According to the statement of her female friends, she soon after became deadly cold, her countenance altered to the expression of death, she lost all voluntary power, and her eyes became deeply sunk in their orbits. In this state she is reported to have spent the night, having vomited and been purged about six times. A more precise history could not be obtained.

"At 9 a. m. on the 18th, she was seen by Mr. Nesham, by whose direction a vein was opened in the arm. The blood issued difficultly, was at first viscid and very dark, but it subsequently assumed a more lively colour. The blood was placed aside, in a small basin, and at 11 a. m. (when I arrived) had separated into a loose, bulky crassamentum, and transparent, but unusually viscid, serum. The crassamentum having been disturbed and broken up by some of the gentlemen present, the serum only was removed for analysis. The patient passed no urine from the commencement of the attack, until its fatal termination on the night of the 18th December. The analysis of the serum is given in the table below.

"Case II. *Intensely Malignant Cholera.* Occurred in the Cholera Hospital, Sandgate, Newcastle, on the 21st December. The patient, James Dewar, aged 39, a sailor, of good habits and colossal frame, was attacked at 6 a. m., on board the smack Nimble, of Leith, with spasms, cramps, purging, and vomiting of the peculiar fluid, which I need not describe. At 9 a. m. he was brought to the Cholera Hospital. Soon after his arrival, he passed a copious characteristic dejection, which was preserved for analysis. He was then given a little ammonia. Another evacuation followed in about ten minutes, and was also set apart. When I saw this patient at 11 a. m., he was perfectly pulseless and cold, his face contracted, and of a tarnished silvery or fishy aspect; he suffered horribly from cramps, and uttered cries like one shouting through a barrel. It was, on the whole, the worst case but one that I witnessed during my stay in the infected districts. A little after 11 a. m., some blood was taken from an orifice in each arm, and about eight ounces, dark in colour and viscid in consistence, were with some difficulty obtained; the patient writhing about his bed so constantly, that the blood could not be preserved from contact with the atmosphere. This blood was also set aside for analysis. Before leaving the ward, I tested the dejections with yellow turmeric paper, and that passed before the ammonia was given, changed the colour of the paper to a deep permanent brown. I should add, it had been ascertained that he had taken no medicines previous to his admission into the hospital. Notwithstanding the most assiduous attention and active treatment, Dewar died the same day at 4 p. m. The serum and coagulum, when

[1] A few copies of this valuable pamphlet are, I believe, still to be obtained from the publisher, Mr. Highley, Fleet street.

carefully separated and weighed, were in the proportion of 43 serum and 57 crassamentum, by which an extraordinary loss in the aqueous portion of the blood was pointed out. The crassamentum was then examined, and found normal in the proportion of its ingredients, so that the addition of a certain quantity of water would have restored it to its original density, proportions, etc. The serum was of the specific gravity 1045, and was devoid of the least action on litmus or turmeric papers; it composition is seen in the table below. Under the microscope, no alteration could be detected in the structure of the blood disks."

Dr. O'Shaughnessy also analysed the blood of a patient, who was labouring under severe bilious and fæculent diarrhœa with vomiting, and the results obtained from the serum are seen in the table: the crassamentum was stated to be found quite normal in its ingredients and their proportions.

Table of Analyses of Serum in Health (Lecanu), *Bilious Diarrhœa, and Malignant Cholera* (Dr. O'Shaughnessy).

	Healthy standard (Lecanu).	Bilious Diarrhœa.	Malignant Cholera. Mrs. Barras.	Malignant Cholera. Dewar.
Specific gravity	1028	1028	1041	1045
Reaction	Alkaline.	Alkaline.	Neutral.	Neutral.
Water	906·00	921·75	854·00	866·80
Albumen	78·00	61·85	133·00	124·00
Urea	0·00	0·00	0·40	0·00
Organic matter, soluble in alcohol and water	1.69	5.20	4·80	4·00
Albuminate of Soda	2·10			
Fatty matters: Crystalline	1·20	1·90	1·40	1·23
„ Oily	1·00			
Chloride of Sodium and Potassium	6·00	5·00	4·00	2·17
Carbonate of Soda, Phosphate of Soda, Sulphate of Soda	2·10	2·30		0·50
Insoluble Salts, Phosphates and Carbonates of Lime, Magnesia, and Iron	0·91	1·10	1·60 [2]	0·70
Loss	1·00	0·90	0·80	1·50
	1000·00	1000·00	1000·00	1000·00

Dr. O'Shaughnessy also mentioned in his Essay, that he had examined the blood in two other cases; in one, the composition agreed, in every essential particular, with Dewar's blood (case 2); in the other, with that obtained from Mrs. Barras. The history of the first case was not known, the other patient's disease was of a protracted type.

After the publication of his Essay, Dr. O'Shaughnessy had the opportunity of making further experiments in London, and he found that the specific gravity of the serum, in four specimens, was as follows:

[1] The 5·00 and 2·30, in the second column, should be estimated together, as part of the phosphates, sulphates, and carbonate of soda were included under the figure 5·00.

[2] In the third column, the carbonate of soda only was stated to be absent, a small amount of sulphate and phosphate being included with the insoluble salts.

1st Case	1042·7	3rd Case	1047·0
2nd —	1054·4	4th —	1051·3

And the amount of colouring matter in the same specimens of blood, with the addition of the two Newcastle cases, estimated according to Prevost and Dumas' method, viz., by assuming the fluid portion of the clot to be serum, was—

1st Case	162·5	4th Case	147·0
2nd —	156·0	5th —	112·8
3rd —	164·3	6th —	136·0

We shall next speak of the analyses made by Dr. Thomson, of Glasgow. The relation he finds existing between the crassamentum and serum in Cholera blood, to a certain extent, gives us an insight into the amount of loss which the fluid portion of the blood has undergone; but it must be borne in mind, that the relation between these may be altered by other circumstances; for the clot consists of the blood corpuscles held together in the form of a mass by a very fine network of coagulated fibrine, enclosing also a certain amount of serum. Now the closeness or density of this clot may be modified by the physical condition, as well as the amount, of fibrine, which may possess very different degrees of elasticity and toughness; it may therefore form a soft and large, or a small and firm clot, even when the ratio between the solid and liquid portions of the blood remains the same,—much more serum being retained within its meshes in the former case. Again, the shape of the vessel, in which the blood is collected, may influence considerably the size of the clot: thus, in an experiment, when separate quantities of the same blood were drawn in a flask and in an open basin, the proportion of crassamentum was found to differ considerably, being in ratio of 13 in the flask to 21 in the open basin. If, however, care be taken to avoid these liabilities to fallacy, by using similar-shaped vessels, and noticing the density of the clot, we can, from such observations, arrive at conclusions which are tolerably correct.

Assuming, then, the ratio between the serum and crassamentum in healthy blood to be as 57 : 43, Dr. Thomson, in five specimens of Cholera blood, found the proportions as follows:

Case.	Serum.	Crassamentum.
1.	32·34	67·66
2.	32·00	68·00
3.	38.45	62·58
4.	35·66	64·34
5.	27.59	72·41

Here we see the ratio, existing in health between the serum and crassamentum, more than reversed. Dr. Thomson also further examined the serum, and found the specific gravity of the different specimens to be, in the

1st Case	1044·6	.. pure yellow serum.
2nd —	1044·3	.. slightly tinged red.
3rd —	1052·0	.. very red.
4th —	1055·0	.. very red.
5th —	1057·0	.. very deep red.
Average healthy serum	1028.0	

He also estimated the water and solid constituents of the serum in these different specimens of blood, and his results, compared with Dr. Marcet's analysis of healthy serum, are seen in the following table.

	Case.	Water.	Albumen, Salts, etc.
Healthy serum	—	900	100
Cholera serum	1	839·5	160·5
——	2	839·6	160·4
——	3	811·7	188·3
——	4	811·0	189·0
——	5	808·2	191·8

Dr. Thomson also attempted to discover the proportion of the albumen and salts in serum No. 1; and then found, that of the 160·5 parts of solid matter, 150·15 consisted of albumen and 10·35 of salts, with which, however, he included the organic matter of the serum, which was soluble in boiling water, and therefore the figure 10·35 represents what is usually included under the head of salts and extractive matters. From this one analysis, Dr. Thomson calculates the ratio between the albumen and salts in the remaining four specimens of serum; this, of course, must be considered as a very unsatisfactory mode of proceeding, especially in examinations of blood in a disease, where it has by no means been proved that the different constituents of that fluid are always altered in the same proportion. Dr. O'Shaughnessy has attempted to deduce the amount of real salts from the analysis given by Dr. Thomson, but I think it unwise to do so, and we had better remain satisfied with such information as the experiments warrant us in arriving at. Again, with regard to the colouring matter of the blood in Cholera, Dr. Thomson has given his results, but his mode of analysis employed to separate the former substance is very faulty, and, consequently, unsatisfactory. As to the fibrine, I think we have other analyses on this point which can be more depended on.

Lastly, Dr. Clanny made several analyses of Cholera blood, and although the methods employed by him may not, perhaps, bear criticism, yet as they were compared with healthy blood, the composition of which was determined in a similar manner, some of the results are valuable; they show that, in Cholera, there is a loss of the watery portion of the blood; that the globules and other organic solids are increased; that the fibrine is usually diminished; and that the physical condition of the blood is also altered, by its becoming dark in colour and thick in consistence.

Besides the analyses which have been given above, many others were performed during the last epidemic, some as to the composition of the entire blood, others merely for the purpose of determining certain points. These I have thought it unnecessary to detail, for the chemistry of organic fluids was at that time very imperfect, (especially before the appearance of the admirable essay of Lecanu, entitled *Nouvelles Recherches sur le Sang*); and consequently but little confidence would at the present time be placed in some of the analyses. With regard, however, to the detection of urea in the blood of Cholera patients, I may observe, that it was found by Marchand, Heller, Simon, and Rainy; others were unsuccessful in the search; we have already seen that Dr. O'Shaughnessy detected it in the first case (Mrs. Barras), but not in the second (Dewar). Urea was also found in the bile, and by Dr. Christison in a serous effusion on the brain of a patient dying of Cholera.

On reviewing the analyses, which are given above, we shall be enabled

to form some general conclusions as to the condition of the blood in Cholera; but previous to so doing, I think it will be well to make some remarks on the detail of these analyses. And first, with regard to the physical condition of Cholera blood;—nearly all observers are agreed on this point, viz., that the consistence and colour are altered, that it becomes much more viscid than natural, and usually darker in colour and less coagulable; the extent, however, of these changes appears to depend much on the stage when the blood is drawn. Next, with regard to the alteration which it undergoes in composition.

Water. All the analyses given above, show that this portion of the blood becomes much diminished in quantity: this is seen from the experiments of Lecanu, Wittstock, Hermann, O'Shaughnessy, Thomson, and Clanny. There seems to be no discrepancy of opinion on this point; the same remarks apply, of course, to the increase of the solid constituents of this fluid.

Blood Globules or Red colouring Matter. Most observers have found that this portion of the solid matters of the blood becomes increased in amount; but others, as Dr. O'Shaughnessy, think that it is not necessarily increased beyond the normal standard; most of his results, however, show such an augmentation The different modes of separating this principle have, doubtless, led to much of the discrepancy observed in the analyses. Dr. O'Shaughnessy, in criticising the results obtained by Dr. Thomson, states, that the method employed by himself "shows precisely and infallibly the quantity of colouring matter"; but I think I have evidence sufficient to prove, that it is liable to very considerable error, and that the assumption, that the fluid contained in the clot is of the same nature as serum, is by no means correct.

Fibrine. From what we have seen above, it would appear that this principle is liable to great alteration in Cholera blood: in general (but not necessarily), it would seem to be diminished in quantity.

Composition of the Serum. All the analyses agree in showing that this part of the blood is especially affected in this disease. One of the most important alterations, which it undergoes, consists in the diminution of its watery portion, and consequent increase in its solid constituents, a change indicated by its high specific gravity. From the numerous observations on this point, we have found that it has varied between 1036 and 1057, the lowest 8, the highest being 29 points above the average weight in health—viz., 1028. It would also appear that there is a considerable tendency to its becoming less alkaline, and even neutral, in its reaction. (O'Shaughnessy).

Albumen. If we estimate this body in relation to the water of the serum, we find that its proportion is always increased in Cholera, and it is chiefly to this augmentation that the high density of the fluid is due; all the results given above show this fact; but if the albumen be estimated in the 1000 parts of the blood itself, then there are considerable discrepancies in the different analyses. The reason of this it is not difficult to discover; for, by the methods employed by some, a considerable amount of the albumen was included under the head of colouring matter, thereby increasing the figure of the latter principle, and diminishing that of the former. It is, however, easy to understand

how the albumen may be greatly increased in the serum, yet even diminished in the blood, taken as a whole; for the serous portion (including albumen) might be lessened in quantity, from intestinal evacuations, to such an extent, that the absolute amount of albumen in a given quantity of blood should be below the normal amount. I believe, however, as Dr. O'Shaughnessy has stated, that such was not the case in the blood examined at that period.

Salts. Concerning the alterations in the saline portion of the blood, very much has been written, and from the results obtained in some of the analyses, peculiar methods for the treatment of Cholera have been proposed and employed. It is therefore exceedingly important to examine this point, and see what value should be attached to the experiments, upon which the conclusion, as to great diminution of the salts of the blood in Cholera, is based.

If we examine the table given above, containing the results of the analyses of the serum in health by Lecanu, in a case of bilious diarrhœa, and in two cases of Cholera by Dr. O'Shaughnessy, we observe that Lecanu, in healthy serum, finds 8·1 parts of soluble salts in the 1000 parts of serum, of which 6 parts consist of chlorides, the remaining 2·1 parts of soluble phosphates, sulphates, and carbonates, which are not individually estimated. Dr. O'Shaughnessy, by employing the method of Lecanu, finds, in the first case (Mrs. Barras,) only 4 parts of chlorides, no carbonate of soda, and very small quantities of the sulphates and phosphates, which he estimates with the insoluble salts. In the second case (Dewar,) he finds a still smaller amount, only 2·17 parts of chlorides, and of soluble phosphates and sulphates, and carbonates, 0·5 parts: in the case of bilious diarrhœa, 5 parts of chlorides were found, and 2·30 of phosphates and sulphates, and carbonates. Granting the accuracy of these experiments, we should arrive at once at the conclusion, that, in Cholera, the saline portion of the serum undergoes a remarkable diminution. I may, however, mention, that when Dr. O'Shaughnessy made these analyses, the Essay of Lecanu had but just appeared, and that by the method adopted by this chemist for ascertaining the amount of salts, great care is necessary, and I might add, some considerable experience, to enable the experimenter to collect the whole of the saline matter; and I think that it is possible that the estimates given in the table may be below the real amounts which existed in those specimens of serum: still, however, in the case of bilious diarrhœa, the quantities nearly approached Lecanu's standard. I venture to suggest this, not from any desire to cast the slightest doubt on the accuracy of Dr. O'Shaughnessy, but from the circumstance of others not having found such deficiency in serum, which in other respects resembled that operated upon by him. That errors must exist somewhere in these analyses, I think can be shown from the fact, that the serum in the case of bilious diarrhœa, stated to be of specific gravity 1028, the same figure as that given by Lecanu for his standard serum, contained of solids, in all, 78·25 parts in the 1000, whereas Lecanu found 94·00; and to show that this difference did not depend on the different proportions of the organic and inorganic constituents, it is found, that not only were the total solids, but also both the organic and inorganic portions, in larger amount in the serum analysed by

Lecanu. Again, if we compare the serum of Mrs. Barras, specific gravity 1041, with that from Dewar, specific gravity 1045, we find that, although there is as much as four points difference in weight, both the organic and the inorganic portion of the solid contents of the former were greater than those existing in the latter. It is certainly impossible to explain these facts, except by assuming that some error existed in the analyses. Dr. Thomson came to the conclusion, that the salts were not diminished in Cholera blood; but, as stated before, the extractive matters were estimated with this portion, and therefore the separate determination of the salts can only be a matter of speculation. There is another reason for my supposing that the salts in Dr. O'Shaughnessy's analyses of Cholera blood may possibly be estimated too low; namely, that in two examinations of serum of specific gravity very much the same as that of case 2 (Mrs. Barras,) I failed to find such a diminution, although the experiments were repeatedly and very carefully performed; but of this we shall again have occasion to speak. With regard to the amount of salts in the remaining four specimens of serum, of which Dr. O'Shaughnessy ascertained the specific gravity, I am not aware that any estimation was ever made.

The conclusions, to be drawn from these researches, may be stated as follows:—

1. That in Cholera, the physical characters of the blood are altered, and that its tendency is to become thicker, tar-like, and less coagulable.
2. That the proportion of water is much diminished.
3. That the specific gravity of the serum is very high, which is due to the increase of the solid portion of the serum, and especially of the albumen; and that this fluid also tends to become less alkaline in its reaction.
4. That with regard to the salts of the serum, some doubt exists as to their excessive diminution.
5. That urea sometimes exists in Cholera blood.

At the end of the second part of our paper, we shall see whether any of these conclusions are affected by more recent analyses; and also, whether any further results can be with safety deduced.

II. RESULTS OF ANALYSES OF CHOLERA BLOOD MADE DURING THE PRESENT EPIDEMIC.

The analyses, which we are next about to detail, were made upon eight specimens of Cholera blood, in some of which, from their quantity or condition, only certain points could be determined with accuracy. Two of these analyses were performed by my friend Dr. PARKES, the remainder by myself; and I may again mention, that the want of more thorough investigation has been due, not to any lack of zeal in pursuing the subject, but to the great difficulty experienced in procuring the fluid for analysis.

It may be as well, before treating of these details, to mention some analyses of healthy blood, so that we may be enabled more readily to compare the results, which we may obtain in our examinations of the diseased fluid, with those observed in health. I will first give a table shewing the composition of the blood of healthy males and females, according to BECQUEREL and RODIER.

Composition of Human Blood. Adult Male in the 1000 *parts.*

	Mean.	Maximum.	Minimum.
Density of defibrinated blood	1060·2	1062·0	1058·0
——— Serum	1028 0	1030·0	1027·0
Water	779·0	800·0	760·0
Solids	221 0	240·0	200·0
Blood globules	141·1	152·0	131 0
Fibrin	2 2	3·5	1.5
Albumen	69·4	73·0	62·0
Extractives and free salts	6·8	8·0	5·0
Fatty matters	1·600	3·255	1·000
1000 *Parts of Blood after calcination yielded.*			
Chloride of sodium	3.1	4·2	2·3
Soluble Phosphates, &c.	2·5	3.2	2·0
Insoluble Phosphates, &c.	·334	·700	·225
Iron	·565	·633	·508

Human Blood. Adult Female in 1000 *parts.*

	Mean.	Maximum.	Minimum.
Density of defibrinated blood	1057·5	1060·0	1054·0
——— serum	1027·4	1030·0	1026·0
Water	791·1	813 0	773·0
Solids	208·9	227·0	187·0
Blood globules	127 2	137·5	113·0
Fibrin	2·2	2·5	1·8
Albumen	70.5	75·5	65·0
Extractives and free salts	7·4	8·5	6·2
Fatty matters	1·620	2·860	1·0
1000 *Parts of Blood after calcination yielded.*			
Chloride of sodium	3·9	4·0	3·5
Soluble phosphates, &c.	2·9	3·0	2·5
Insoluble phosphates	·354	·650	·250
Iron	·541	·575	·486

As these analyses very much accord with those made by myself on healthy human blood, I shall use them for the purpose of comparison. As regards the serum, we may take Lecanu's standard, which has been given in Part I; and I may state that, for the purpose of ensuring accuracy in the analyses of morbid serum, I have employed the same method, and obtained figures representing the proportion of the most important constituents of this fluid, as derived from a healthy patient.

This analysis is seen below.

Serum. Specific gravity 1027·9. Alkaline in reaction; contained in 1000 parts.—

Water	909·25
Solids	90·75
Albumen, Fatty and extractive matters	80·48
Soluble salts	9·34
Insoluble salts	0·93

The methods employed in performing these examinations of blood and of serum were as follows:

Analysis of Blood. The physical characters of the fluid were first noticed, also the reaction which it exhibited with blue and red litmus papers; the specific gravity was afterwards ascertained. If the blood was in such a condition that it would neither coagulate nor allow the globules to subside, a weighed portion was at once evaporated to dryness;

and, after it had ceased to lose weight by exposure for some little time to a temperature a little above 212° Fahrenheit, the amount of the solid residue was ascertained: by this operation, the *water* and *total solids* were obtained. The residue was then carefully burnt in a platina crucible; and, after the charred mass had been exposed to a red heat for a short time, and it had ceased to give off any odour, the weight of the black mass, consisting of the inorganic constituents together with carbon, was ascertained; it was then boiled several times in distilled water, for the purpose of removing all the soluble salts, and thoroughly dried and reweighed; the loss indicating the quantity of soluble salts, with the exception of a small amount, which is retained very strongly by the carbon. The carbonaceous mass was then exposed to a bright red heat for some little time, until all the carbon had been burnt off; the residue consisting of the insoluble salts, with a trace of the soluble salts spoken of above: these were separated by washing, and their quantities ascertained. All the numbers were then reduced to the 1000 parts. In analysing the serum for its saline constituents, the method above detailed was employed, and the albumen afterwards determined from aseparate portion. The blood globules were estimated according to the method of Prevost and Dumas, or of Becquerel and Rodier. The fluid contained in the clot was regarded as serum. The urea was estimated by exhausting the dried blood with alcohol, and adding strong nitric acid to a concentrated watery solution of the alcoholic extract. The presence of uric acid was determined, by exhausting with water the dried blood, which had been previously acted upon by alcohol, for the purpose of extracting the urea, and then employing the murexide test, or precipitating the uric acid by the addition of acetic acid to the concentrated watery solution.

Case I. The first case occurred in one of the Tooting children, Michael Harper, ætat. 9; he was seized about nine o'clock P.M., and died on the following day about half-past one P.M. Having passed one very copious evacuation, and another more scanty, he sank into a state of collapse; before death, the rice-water fluid had soaked through the bed; he vomited at intervals during his illness, and the urine was probably suppressed. A *post-mortem* was made thirty-eight hours after death.

General Appearances. Rigidity was present in the jaw and in all the large joints, but not so well marked in the toes; the surface of the body was not livid, but had a mottled appearance; the nails of the left hand, however, were livid; the teeth were covered with sordes; the body weighed forty-five pounds avoirdupois.

Head. On opening the head, the large sinuses of the dura mater were found filled with blood; the veins of the pia mater were also turgid, so as to give the brain a congested appearance. On making a section of the brain, the distinction between the grey and white matter was strongly marked; in the latter the red points were pretty numerous, in consistence both were normal; a very small amount of fluid was found in the lateral ventricles. Weight of the cerebrum, 42 oz.; of the cerebellum, 5 oz.; of the medulla oblongata and pons Varolii, 6 drachms. Nothing remarkable was found, on making sections of these different parts. The sinuses at the base of the skull were full of blood.

Thorax. On opening the chest, the lungs were found universally

adherent, the adhesions being tough, and doubtless produced by old pleuritic inflammations. The right lung was of small volume, sparingly crepitant; on section the colour was dark, the substance firm but not hepatized, and it did not contain much blood or serum; there was no consolidation at the apex, nor were tubercles found throughout the substance; the bronchial tubes contained some frothy mucus. The left lung was lighter in colour than the right, but still of a deep red; on pressure, much blood exuded from the small vessels, particularly from the inferior and depending portions; no tubercles were observed; the bronchial tubes contained a little frothy mucus. The larynx and trachea were healthy, and exhibited but slight vascularity.

Heart, &c. The pericardium was healthy, and contained no fluid. The heart weighed four ounces and two drachms; the right auricle was much engorged, and contained a large but partially decolorized clot; the right ventricle contained a large colourless, very soft coagulum; in the left ventricle was found a small colourless coagulum. The substance of the whole organ was healthy.

Œsophagus, &c. The mucous membrane of the pharynx and œsophagus was natural.

Stomach. The peritoneal surface was pale, the mucous membrane but very slightly vascular, not softened, containing a small quantity of a thickish dark brown fluid, smelling of port wine—about ʒiv. in quantity.

Small Intestines. The peritoneal surface had a tolerably well-marked vermillion tint. In the duodenum the glands of Brunner, and also the solitary glands were enlarged. In the ileum, the solitary glands were also strongly marked, and Peyer's glands elevated and red in colour.

Colon not contracted; its peritoneal surface was pale, and the glands were enlarged in the ascending portion. In the descending and transverse portions, the mucous membrane was pale.

Liver. Weight twenty-one ounces, two drachms; was adherent to the diaphragm over the greater portion of the right side. The gall bladder was moderately distended with bile of a deep green colour, and of viscid consistence.

Spleen weighed two ounces and six drachms, and appeared healthy in structure.

Kidneys. The right weighed two ounces and two drachms, the left two ounces. In both, the substance was healthy, and the capsule easily separable.

The Bladder was quite empty and very firmly contracted (like a ball).

The blood in the sinuses of the brain, heart, and large vessels, was not coagulated, but had a consistence and appearance not very unlike tar.

The mesenteric glands were not enlarged, the omentum contained but a very small quantity of fat, and on the walls of the abdomen a layer of that substance was found, not measuring more than one-fifth of an inch. In the small intestines was contained some fluid, of the consistence of gruel, and about three or four ounces in quantity, which possessed an alkaline reaction, and under the microscope presented the appearances which are exhibited by the rice-water evacuations of cholera

patients, the deposit consisting of cylindrical epithelium scales, organic globules, etc. The contents of the intestines were, however, much thicker than the watery evacuations usually passed during life, but were similar to those, which have frequently been found after death in cholera patients.

On allowing the thick fluid to remain for some time in a glass, it separated into two parts, the clear portion being uppermost. This was found to contain a large amount of albumen, but no trace of *bile*. It did not give the pink tint which cholera stools frequently exhibit when treated with nitric acid, but this I have found to be not unusual in the latter stools passed by cholera patients. The blood was of a very dark colour, but became slightly reddened by exposure to the air. It did not coagulate; but, on minute examination, small specks were found in it, consisting of very soft fibrine; when allowed to remain at rest for some hours, the blood scarcely exhibited a layer of serum on its surface, and it would not pass through coarse filtering paper, as is the case generally with this fluid. Under the microscope, the globules were seen to be very numerous, and some irregular in shape. Specific gravity of the blood 1076.5, at 45° F.; reaction slightly alkaline.

Composition in 1000 parts.

Water	729
Solids	271
Blood globules } Albumen, &c. }	260·2
Soluble salts } Insoluble ditto }	10·8

No urea was detected; traces of uric acid were however found, which would probably indicate the presence of urea also; but the amount of blood used for this experiment was small. I may remark that the quantity used, to determine the salts, was likewise very small.

Another analysis was made of the top portion of the same blood, after a partial subsidence of the blood globules had taken place, and in 1000 parts it was found to contain:

Water	851·4
Solids	248·6
Blood globules } Albumen, &c. &c. }	233·9
Soluble salts	12·6
Insoluble ditto...	2·1

Here we find, that when more serum was present in the blood, the soluble salts were greatly increased and the insoluble decreased, at the same time that the total solids were diminished: hence, if the serum could have been separately determined, it would doubtless have shown a very large proportion of salts.

Case II. The second case also occurred in one of the Tooting children, James Andrews, ætat. 6 years. He was suffering from diarrhœa when removed from Tooting, and at half-past six in the following morning was seized with vomiting and collapse, and died at half-past eleven. The evacuations were characteristic, but their amount not ascertained. He was stated to have been purged five or six times.

The *post mortem* was made 140 hours after death.

General appearance. Rigidity nearly gone off in the lower extremities, quite so in the jaw and upper extremities; the surface not livid, but mottled, with red patches, with the exception of the abdomen, which had a yellowish green appearance. The nails of the fingers and toes were livid, the skin of the soles of the feet was wrinkled; the body had not undergone any decomposition, although death had occurred so long before.

Head. The sinuses of the dura mater contained some thick dark-coloured blood, and the veins of the pia mater were full of the same fluid. In the substance of the brain, the grey and white matters were well contrasted. Very small amount of fluid in the ventricles. The cerebellum and medulla appeared quite healthy.

Chest. The pleura was very slightly adherent at the left side, and at the base of the right lung, which was slightly congested, but intact; left lung very slightly congested; no tubercular deposition. The bronchial glands were rather enlarged.

Heart. No polypi were found either in auricles or ventricles, but a very small thread-like and whitish coagulum in the first portion of the aorta, the consistence of which was soft. The heart was of the natural size, and the substance healthy.

On making a section of the abdominal walls, a layer of fat, about one-fifteenth of an inch, was found, and the omentum scarcely contained any of that substance. The mesenteric glands were considerably enlarged, and contained deposits of tubercular matter.

Stomach. Peritoneal surface healthy. Mucous membrane not softened, but stained red in patches. A small quantity of a thickish fluid was found in the cavity of the organ.

Intestines, &c. The peritoneal surface of the small intestines had a vermillion tint, from the injection of the small blood vessels. The mucous membrane was not softened; in the lower portion of the ileum, the solitary glands were very prominent. A small quantity of a thickish white matter was found on the surface of the mucous membrane, which exhibited the same appearances under the microscope, as that found in the intestines of the last case. The large intestine presented a greyish white appearance on its peritoneal surface, and its mucous membrane was healthy.

Liver, etc. Substance of this organ healthy; gall-bladder filled with bile, of moderate consistence, and of a yellowish brown colour. Spleen healthy.

Kidneys. Quite healthy; the urinary bladder strongly contracted.

The blood was of similar character in all parts of the body; that found in the heart and large vessels was used for analysis. It was of a dark colour and treacle-like consistence; the specific gravity was not ascertained, on account of the small quantity procured. The globules did not subside when the fluid was allowed to rest, and minute specks of fibrine were observed floating in it.

Composition.	Water		724·5
	Solids		275·5
	Globules, albumen, etc		262·0
	Salts—Soluble	10·7	13·5
	Insoluble	2·8	

Urea was not detected; a small quantity of uric acid, however, was crystallised, perhaps a little exceeding in amount that found in health; but for these determinations, as well as for the saline constituents, only a small portion of blood was employed.

For the two following observations and analyses, I am indebted to Dr. Parkes.

Case III. Blood taken from the heart and pulmonary arteries of a young woman, who died in the cold stage of Cholera. It had a dark colour, was thick in consistence, but not coagulated; it did not separate into clot and serum, but had small masses of fibrine and coagula floating in it. It was not certain whether the whole of the fibrine had been removed from the vessels. When exposed to the air, the blood became in part arterialized; but there were many small portions or coagula, which, after twenty-four hours' exposure, remained as black as at first. The *reaction* was alkaline. The fibrine was estimated by washing a weighed portion of the blood, in which the small clots were equally diffused by shaking. There was no difficulty in washing the fibrine quite white; if anything, this was done more easily than usual. In evaporating the blood to get the proportion of solid contents, it was remarkable how easily the drying mass was broken down, and how pulverulent it became, under much slighter pressure than is sufficient to break down healthy and inflammatory blood. As the ingredients of the blood were so mixed up together, it was impossible to do more than estimate the fibrine, the albumen and globules together, the insoluble and soluble salts, and to examine for urea and uric acid. Specific gravity (of whole blood), 1076·22; temp. 62°.

Composition.	Water	729·07	
	Solids	270·93	
			1000·00
Fibrine		·88	
Red particles and organic solids of serum		262·61	
Soluble salts		6·15	
Phosphate of lime, phosphate and free oxide of iron ..		1·29	
		270·93	

The solution of the soluble salts was alkaline; their amount was over the figure stated above, as there was a trifling loss; that given was absolutely weighed. The quantity of each salt was not determined; but there was, as is usual in healthy blood, a great excess of chlorides. The precipitates of the ammoniaco-magnesian phosphate and the sulphates seemed to be in about the usual quantity.

Examination for urea and uric acid. A portion of pulverized blood was thoroughly digested in repeated quantities of alcohol; the alcohol distilled off, and the residue dissolved in a little distilled water; it was evaporated slowly to a syrup, and a little nitric acid added. After thirty-six hours, no crystals had formed. The blood which had been treated with alcohol was now boiled thoroughly with distilled water; the solution was evaporated; the residue, re-dissolved, evaporated to a very small bulk and treated with hydrochloric acid. After forty-eight hours, no crystals of uric acid had been deposited.

It appears, therefore, that if urea and uric acid were present, they were not in any great quantity. A possible inaccuracy may have occurred in the analysis for urea, as at one time the alcoholic solution was distilled too rapidly, and the urea may have been decomposed. The quantity of fat taken up by the alcohol seemed to be considerable; it was not weighed.

Case iv. Blood from the venæ cavæ of a woman, who died in the cold stage of Cholera. It presented the same physical characters as in the former case; small masses of clot floated in a thick red fluid. The reaction alkaline, but not so strongly marked as usual. Specific gravity 1068·16; temp. 45 Fahr.

Composition.	Water		748·46
	Solids		251·54
			1000·00
Organic constituents of blood		244·263	
Soluble salts		5 72	
Perodide of iron		·884	
Phosphate of lime		·673	
		251·540	

It was not analyzed for urea or uric acid.

Case v. With regard to the next case, it may be well to state, that, as the patient's symptoms during the progress of the disease, the stools passed at the different periods, also the blood abstracted during life, and that found in the vessels after death, were carefully examined, it has been considered advisable to go somewhat into detail, for the purpose of endeavouring to give as complete an account of a case of Cholera as is at present on record. Dr. Parkes undertook the examination of the stools; the analyses of the blood were made by myself: the patient was under the care of Dr. Williams.

William Worts, æt. 39, native of Wicklow (Ireland), admitted into University College Hospital Feb. 1st, 1849, had been a sailor since the age of twelve years; a strong, stout man, having enjoyed good health, but at times had been addicted to hard-drinking. About a month previous to his coming to London (Jan. 28th), he had lived in Liverpool, in a house near the side of the river, and during that period had been very intemperate, and consequently had taken but little solid food. On his arrival in town, he lodged in an inn near the Euston-square railway terminus, and the same night was intoxicated. The next day, Jan. 29, he became cold and shivering, for which he took some spirits; he felt very unwell all that day, vomited several times, and during the night had some pain in the abdomen, and diarrhœa. These symptoms continued during the whole of the 30th, on which day he took no solid food; slight cramps were felt in the calves of the legs at night, when the purging and vomiting became more violent, and the thirst intense, to relieve which he took a large quantity of water. On the 31st, and up to the middle of the next day, Feb. 1st, the above-mentioned symptoms continued unabated, and the cramps increased in intensity.

On admission, at two o'clock, p.m., he was extremely feeble; the hands and face were of a dusky hue, eyes a little sunken, surface warm, pulse 120, but extremely weak; tongue dry, covered with a brown fur

in the centre, but white at the edges. Had been purged several times during the last hour, the stools containing some bile-pigment; vomiting incessant, cramps in arms and legs, voice peculiar; has not passed more than half a pint of urine for the last twenty-four hours.

4 P.M. Feels very cold, face and hands rather more livid, quite dry. Since two o'clock he has passed three stools, still containing bile-pigment; breath becoming cool, and respiration hurried.

8 P.M. Has had only two stools. Pulse rather stronger and surface warmer, thirst continues excessive; has drank seven quarts of toast and water.

11 A.M. Passed a stool, which had the following characters and composition. It separated into two parts, fluid and sediment; the latter rather bulky. The fluid portion was not filtered, but removed by decantation, and had a slightly turbid appearance, and a peculiar faint odour. Reaction, *alkaline;* sp. gr. 1010·3 at 56° Fahr.; with nitric acid and heat, no change of colour was observed, until a considerable quantity of acid had been added, when a slight yellow tint appeared, and a tolerably copious precipitate was thrown down. A trace of uric acid was detected by the murexide test.

Analysis.	Water		984·22
	Solids		15·78
			1000·00
Coagulable organic matter (albumen)		1·9	
Incoagulable organic matter		7·7	
Soluble salts—Chlorides, Phosphates, Sulphates, etc.		6·15	
Insoluble salts (Phosphate of lime, etc.)		·03	
		15·78	

Dr. Parkes remarks, that the high figure of the solids must be in part attributed to the fluid not having been filtered, as it was thought to be too thick.

Feb. 2nd, 1 A.M. Pulse 100, very small, at times almost imperceptible; respirations 26 in the minute; surface cold and dry; tongue and breath cold; skin of hands slightly wrinkled. About four ounces of blood were taken from the arm; after which the pulse became 120, and the respirations 32 in the minute; temperature in the groin 86° Fahr. The blood presented the following characters. It was certainly more viscid than healthy blood, and flowed with some difficulty from the veins; one portion was set aside, in which coagulation took place in a few minutes, and, after a time, a tolerably consistent clot was formed. Another portion was whipped to separate the fibrine. By exposure to air the fluid became slightly reddened, and under the microscope no abnormal appearances were observed. Density of defibrinated blood, 1076 at 50° Fahr.; of serum, 1040 at 60° Fahr.

Composition in 1000 *parts.*	Water		717·5
	Solids		282·5
Blood globules		166·00	1000 00
Fibrine		2·61	
Albumen		103·50	
Extractive fatty matters, salts, etc.		10·39	
		282·5	

The salts, determined by burning, were found to be, in 1000 parts of blood, 8·32 parts. The soluble and insoluble salts were not separately determined. Urea was found, and in the 1000 parts of blood amounted to 0·38 part. The serum had a slightly reddish tint, a reaction but slightly *alkaline*, specific gravity 1040, and in 1000 parts contained—

Water		862.9
Solids		137·1
		1000·0
Albumen	125·40	
Extractive and fatty matters	2·54	
Soluble salts	8·12	
Insoluble ditto	1·04	
	137·1	

The chlorides separately determined, by direct weighing, amounted to 5·41 parts, and consequently the soluble phosphates, &c. to 2·71 parts.

5 A.M. Pulse 120; respirations 28. Very restless; complains much of exhaustion and pain in the body; has intense thirst, and has taken eight gallons of toast water since 1 o'clock: vomiting continues; breath decidedly cold. He passed one stool about half-past two, which, on examination, gave the following results. It was thicker than the last, not readily separating into two parts; the flaky matter was very abundant, and gelatinous in appearance. The fluid portion, with great difficulty strained through muslin, was white and opaque, of the usual faint odour, and *strongly alkaline* reaction. Specific gravity 1014·5 at 56° Fahrenheit. With heat and a few drops of nitric acid a precipitate fell; a few more drops of acid gave a light pink tint, which was destroyed by additional acid. No bile could be detected by Pettenkoffer's test. (The fluid, however, and not its alcoholic extract, was used in the experiment.)

Analysis.	Water		976·2
	Solids		23·8
			1000·0
	Coagulable organic matter (albumen)	2·93	
	Incoagulable organic matter	10·93	
	Soluble salts	8·24	
	Insoluble salts	1.70	
		23·80	

Dr. Parkes remarks, that the large proportion of incoagulable organic matter in this stool, as in all the others, was evidently owing to the fact, that the fluid was very turbid, and was not filtered, or rather, would not pass through filtering paper. It is worthy of note, however, that the phosphate of lime is, in the analysis of the second stool, much more abundant than in that of the first; and this seems to have some relation to the quantity of incoagulable organic matter.

7. A.M. Surface rather warmer; pulse 130, scarcely perceptible; respirations 33; has had less cramp, and feels easier. A stool was passed between seven and eight: still thicker than the last; of a yellowish brown colour, and in quantity about three ounces. It did not separate into two parts, but the sediment remained suspended; by greatly heating it, however, the sediment was partially thrown down. The stool was esti-

mated as a whole. Odour peculiar, slightly fæculent. Reaction markedly *alkaline*. Specific gravity 1017·2. Temperature 56° Fahrenheit.

Composition of fluid and sediment together.

Water	964·78
Solids	35·22
	1000 00

The organic matter, soluble salts, and phosphate of lime, were not determined. The solution of the dried solids was alkaline, like the stool.

Another small stool, passed about a quarter past eight, only one ounce and a half in quantity, was of a brownish yellow colour. Not further examined.

11 A.M. Pulse 120; stronger, has no pain, and is less restless; has passed one stool, about three ounces; whiter in colour than the two last, but still very thick. After twenty-four hours it had partially separated into a fluid and a bulky sediment, which consisted of a yellowish gelatinous looking matter, having white flakes distributed through it.

1 P.M. Pulse 110; respirations 22; temperature of mouth 87° Fahrenheit, of axilla 93°, of groin 94°; complains of burning heat at the epigastrium, and vomits frequently. He passed a stool about twelve, not more than two ounces in quantity, much thinner than the three last, and partially separating into a fluid and sediment: fluid opaline and turbid; sediment flocculent. Reaction strongly alkaline: odour as usual, or slightly fæculent. The fluid, strained through muslin, was very turbid. Specific gravity 1014; temp. 60°. The liquid became turbid by heat. On adding a few drops of nitric acid, there was no change of colour, but a precipitate appeared. A few more drops gave a light red tinge; again adding a few drops increased the colour; but a great excess diminished its intensity, yet did not destroy it.

Composition.

Water	986·52
Solids	13·48
	1000·00

Coagulable organic matter	3·50
Incoagulable and phosphate of lime	1·98
Soluble salts	8·00
	13·48

The soluble salts seemed to contain an unusual proportion of the phosphates, judging from the precipitate of the ammoniacal magnesian phosphate and the yellow phosphate of silver: the quantity was not determined.

7 P.M. Pulse 120; not so weak as before; breath much warmer; temperature of mouth 90°; of axilla 95°; has vomited some green fluid; stools passed at 2 p.m. and at 5. That passed at two o'clock was more copious than the last, and consisted of a turbid yellowish fluid with large white flakes, partly suspended and partly separated. Reaction strongly alkaline. That passed at five o'clock was much thicker, and did not present the rice-water character, nor separate into two parts. It was of a dirty yellow colour, mixed with white flakes. Reaction, slightly alkaline.

11 P.M. Improving: pulse stronger; surface warmer: has passed two stools between eight and half-past ten. The first was much more

consistent, almost uniformly brown, with a very few whitish or yellowish flakes; not copious. Reaction, alkaline. The latter was still more consistent than the previous stool, and had a distinctly fæculent smell; colour brown. Reaction, still decidedly alkaline.

February 3rd, 10 A.M. Pulse stronger; skin warmer; still very thirsty; and continues to vomit: the fluid from the stomach always showed a strongly acid reaction, and at this time was of an apple-green colour. Specific gravity, 1003; and a stool passed at 4 a.m. was of tolerable consistence, brown colour, and fæculent odour. Reaction, alkaline.

2 P.M. Thirst much less intense; vomiting much abated; fluid still green in colour; surface warm, and of its natural colour: pulse 108: bowels have not been acted upon since 4 a.m.

10 P.M. Pulse 104, weak: skin and breath cold: complains of great weakness.

February 4th, 4 A.M. Pulse intermittent; face and hands cold; skin shrivelled and with a blueish tinge.

7 A.M. Face of a purple hue; pulse very weak and intermittent; no purging.

2 P.M. Has rallied a little: pulse 108, moderately firm.

11 P.M. Has again become cold; the surface moist, and the pulse extremely weak: the bowels were acted upon in the evening; the stools were fluid and dark-coloured.

February 5th, 10 A.M. Continues cold: face and hands of a dark hue. In the afternoon he was sinking: pulse not perceptible, and the surface covered with a cold sweat. In this state he continued until half-past nine in the evening, when he died.

Sectio Cadaveris, 18 *hours after death.* Slight discolouration at the posterior parts of the body: fingers and toes contracted; on section, the blood flowed slowly from the vessels, was thick and dark in colour; the textures appeared deficient in moisture. On opening the chest, the lungs collapsed moderately; the omentum was loaded with fat; the stomach and large intestines were filled with gas; the small intestines were contracted: the body was very free from disagreeable odour.

Chest. The *larynx* and *trachea* were a little congested, especially in the posterior wall. The *right lung* was engorged and dark in colour, mostly at the back part: the blood being contained chiefly in the large vessels: it floated in water. The *left lung* presented a very similar appearance to the last, with the exception of a slight puckering and consolidation at the apex: the mucous membrane of the bronchial tubes was injected, with ecchymoses, and lined with a viscid mucus streaked with blood.

The *Heart* was flabby in its substance; all its cavities collapsed. The left ventricle was healthy; the right contained a soft fibrinous coagulum: the mitral, tricuspid, and semilunar valves were healthy; the aorta was filled with dark-coloured non-coagulated blood.

Œsophagus. The mucous membrane of the pharynx and œsophagus presented a congested appearance, especially at the lower portion.

The *Stomach* was lined with a yellowish green mucus. The surface of the mucous membrane was congested; and, in some spots, a slight extravasation of blood had taken place; the rugæ were prominent. The mucous membrane of the *duodenum* was stained with bile, slightly congested, and Brunner's glands were much enlarged. In the upper part of

the jejunum, the villi were slightly enlarged, and lower down were a few white patches, which appeared like ulcers under a lens; this portion of the intestine was filled with a yellowish mucus. In the lower portions of the ileum, there were a few points of ulceration in Peyer's glands. The peritoneal surface of the small intestines was congested in certain parts; the mucous membrane of the large intestines presented, here and there, patches of congestion, but was not softened.

The *Liver*, on section, showed a little congestion in the hepatic venous system. The gall-bladder was full of bile, of a greenish brown colour, very thick consistence, but not tenacious, as sometimes occurs from the presence of a large amount of mucus: it was neutral in its reaction. Specific gravity, 1044, being much higher than the bile usually found in the human gall-bladder.

The *pancreas* and *spleen* presented no peculiarities. The *kidneys* appeared healthy; so likewise did the bladder, which contained no urine.

WEIGHT OF ORGANS.

Right Lung	17 oz.	Pancreas	4½ oz.
Left ditto	22	Spleen	3½
Heart	14	Right Kidney	6
Liver	59	Left ditto	7

The blood examined after death was taken partly from the aorta, and partly from the vena azygos. It was of thick consistence and dark in colour. Reaction, *distinctly acid*. Specific gravity, 1081·8 at 50° Fah.

Composition in 1000 *parts.*	Water	715·2
	Solids	284·8

Blood globules	171·4
Fibrine	traces.
Albumen Extractives, fatty matters, and salts	113·4

On incineration, 1000 parts of blood yielded—

Soluble salts	7·54	10·43 parts.
Insoluble salts	2·89	

1000 parts of blood contained 0·92 part of urea.

The *serum* obtained from the blood found in the aorta, was of a yellow colour, transparent, distinctly acid in its reaction, the acidity remaining permanent during the evaporation, and the watery solution from the dried matter exhibiting the same phenomenon. Specific gravity, 1039 at 50° Fahrenheit.

Composition in 1000 *parts.*	Water	863·10
	Solids	136·90

Albumen Extractives, fat, etc.	127·84
Soluble salts	7.43
Insoluble ditto	1·63

Case vi. The patient, a married woman, æt. 30 years, was a nurse in the Royal Free Hospital, under the care of Dr. Peacock, from whom I received the blood, and also the following short account of the symptoms. She had been suffering from diarrhœa for two days, when, on the 18th of January, she was seized, at half-past two o'clock in the morning, with vomiting, purging, and cramps; by nine o'clock the collapse was extreme, and continued for about thirteen hours, when she rallied somewhat. From this time she lay in a semi-comatose state,

and died convulsed in the morning of the 21st, at half-past two, nearly seventy-two hours after the accession of the severe symptoms. The urine was suppressed for many hours, but she passed quantities with the stools during the last period of her illness. The stools were not very copious at first; latterly, they were bilious, dark-coloured, and offensive. The post-mortem appearances were those ordinarily met with, when some hours have elapsed since the seizure, and partial restoration of the circulation has taken place.

The blood was thick and dark-coloured, and contained threads of soft fibrine floating in it; no separation of serum took place. Reaction was *very slightly acid.* Specific gravity, 1074·8.

Composition in 1000 *parts.*	Water	740	
	Solids	260	
Blood globules, albumen, etc.			250·64
Soluble salts			6·02
Insoluble ditto			3·54

On examining for urea, this principle was found in considerable quantities; the uric acid also existed in quantities greater than in health. 1000 parts of blood yielded 0·65 part of urea.

Case vii. The last specimen of blood of which we shall speak, was obtained from a patient under the care of Dr. Miller, to whom I am indebted for the opportunity of making the examination. The patient, a man, was suffering from fever consecutive to Cholera, and the blood was taken from the loins (by cupping) fourteen hours before death. The details of the case were published by Dr. Miller in the *Lancet*, Nov. 4, 1848.

The blood had separated into clot and serum. The clot was almost as firm as usual. The serum was clear, of a yellowish tint, darker in colour than usual. Reaction, neither acid nor alkaline to test papers. 1000 grains of serum yielded 1·142 grains of urea, and 0·038 of uric acid. The specific gravity of the serum was not determined.

We will now shortly review the results, which have been arrived at by the analyses recently made, and see how far they accord with those which were given in the first part of our paper.

Physical condition of Cholera Blood. As far as this point is concerned, all recent observations agree with those formerly made, and indicate, that, from the commencement of the disease, this fluid becomes more tenacious, of a darker colour, with less disposition to coagulate, and that its specific gravity is very greatly increased. It will be found by reference to the tables, giving the results of Becquerel and Rodier's examination of the blood of men and women, that the maximum specific gravity in the male is 1062, in the female 1060. Now, in our Cholera cases, we have found the specific gravity in adult males to be, in round numbers, 1076 and 1081, and in females 1068, 1074, and 1076; also, in children under ten years of age, in whom the blood probably has a specific gravity not exceeding 1045, we have found it as high as 1076 in one case, and in the second it was doubtless even higher (for it contained more solid matter), although the small quantity of the blood did not allow it to be accurately determined. We have thus proved, that, in Cholera, this property of the blood is greatly altered.

Water and Solids. Of course, the watery portions of the blood experience a diminution; nearly corresponding to the increase of the specific gravity of the fluid, and the solids a corresponding increase. In the table above referred to, the maximum amount of solids in males was 240, and in females 227, parts in the 1000 of blood; in children it is very much less. In our Cholera cases we have found that the numbers representing the total solids were 251, 260, 271, 271, 275, 282, 284.

Blood Globules. These we have also found to be increased in quantity, in the case in which we have been enabled to separate them from the albumen; and in place of 140 parts in the 1000 (which is considered a very high healthy average), we have found them to form 166 and 171 parts.

Fibrine. In the case (Worts), where the blood coagulated pretty firmly, 2·61 parts of fibrine were obtained in the 1000 parts of blood; in Dr. Parkes' case 0·88; but I remarked that the fibrine in Worts' case, although exceeding in quantity the normal average (2·20,) was yet much less consistent than natural in character. After death, the blood of this man did not coagulate at all, and I think it is probable that in Cholera this element of the blood undergoes changes of quality, rather than of quantity, and that as long as it can be ascertained correctly, analyses do not indicate any marked deficiency; after a time, however, it can no longer be collected.

Serum. As to the specific gravity of this portion of the blood, our observations were only two in number, and these were obtained from the blood of the same patient, at different times; both of them tend to confirm the results previously found; namely, that this fluid becomes much heavier, from the large increase in the amount of its solid constituents; healthy serum being of specific gravity 1028, we found it in Cholera to be 1039 and 1041.

Albumen. This constituent of the serum was only estimated in two cases, and in these amounted to about 125 parts in the 1000 parts of serum, and to 103 parts in the 1000 of blood; so we see that it is increased in both fluids. This we might naturally expect, when we take into consideration the character of the stools in this disease; for in them, we find that, compared with some of the other ingredients of this fluid, the albumen is thrown out in very small proportions; and although the ratio between the serum and clot is diminished, yet the decrease in the water more than counterbalances the loss which the albumen sustains.

Salts of the Blood and Serum. On this point our results have far from accorded with those obtained by Dr. O'Shaughnessy, and upon which so much stress has been frequently laid; we will therefore dwell a short time to consider the facts which have been elicited. Becquerel and Rodier found that the maximum amount of soluble salts in the 1000 parts of blood was, in the male 7·4, the minimum 4·3, the mean 5·6 parts; in the female, maximum 7·0, minimum 6·0, and mean 6·8 parts. We have found in our Cholera cases, that, where the soluble salts were separately estimated, they were represented by the numbers 10·7, 7·54, 7·5, 6·15, 6·02, and 5·72 parts in the 1000 parts of blood; every number exceeding the mean, and many the maximums obtained by Becquerel and Rodier from the healthy

blood both of males and females. The analyses were performed in the same way. Again, with regard to serum in health, in Lecanu's standard we find 8·1 parts in 1000; in a specimen of healthy serum (analysed by myself for the purpose of comparison), 9·34 parts, and in Becquerel and Rodier's table, when estimated in 1000 parts of serum, from about 6 to 8 parts. In the serum of Cholera we observe 8·12 and 7·43 parts; in neither case less than the mean of numerous analyses of healthy serum; and it should be borne in mind, that when the specific gravity of the fluid is high, from the increase of the albumen, as happens in cholera, the estimation of the salts in the 1000 parts of *serum* or *blood* is scarcely correct (for we should rather find the ratio existing between the *water* and soluble salts): if this is done, then, from our experiments, the amount of salts, instead of being *decreased*, as supposed by Dr. O'Shaughnessy, will be found always *increased*. It is curious to remark the composition of the blood in Cases I and II.; the subjects were children under ten years of age, in whom the disease proved rapidly fatal. In both specimens of blood, the soluble salts were very greatly increased; in that from the younger child, they were nearly twice the amount found in health. I should have been almost inclined to doubt the accuracy of these analyses, as they were made on very small quantities of blood, but on looking into my note book, every step appears to have been correctly performed; and, to confirm their accuracy, the third analysis made on the top portion of the blood (much more fluid being used in the operation), shewed a still greater increase of these salts, due to the presence of a larger quantity of serum in a given weight of blood. It would have been extremely interesting to have known the composition of the stools passed by these children, to have seen whether or not the ratio between the water and soluble salts was increased, In Dr. Parkes' paper on Intestinal Discharges in Cholera (*London Journal of Medicine, No. II,*) it will be observed, that the stools passed by children, 10 and 11 years of age, contained in the 1000 parts a smaller amount of the salts than those discharged by adults; and it is possible that there may exist some difference in the mode of action of the poison in children and adults: a difference in the symptoms certainly does exist.

It has been noticed in the cases now referred to, as well as in those spoken of in Part I, that the blood often became neutral, in some cases even acid. Dr. O'Shaughnessy considered this as depending on the blood losing its carbonate of soda, to the presence of which its normal alkaline reaction was referred. At the present time, however, the existence of this salt, even in healthy blood, is denied by many; and certainly many of the properties of the serum, formerly ascribed to it, depend on the tribasic phosphate of soda, which, when it contains two atoms of fixed base, possesses an alkaline reaction, and has the power of holding carbonic acid in solution. That this alkaline salt is not deficient, even when the blood shews a decided acid reaction, was clearly proved by our finding that the ash from such blood or serum exhibited alkaline properties, quite as strong as that obtained from these fluids in health.

The nature of the acid which existed in such blood was not made out; but it certainly was not volatile. Though we have found no diminution of the salts in the blood of Cholera patients, yet, of necessity, the

total amount in the system must be decidedly lessened, but so also is the total bulk of the blood.

Urea. It was stated in our first part, that urea had been detected in the blood and other fluids in Cholera; but in most cases its amount was not estimated, and no relation between the quantity of this principle and the stage or intensity of the disease observed: to this point we paid some attention, and I think that the results obtained will prove interesting. In Cases II and III (Tooting children), no urea was found, and certainly it did not exist in the blood to any large extent. Still, from the small amount of blood examined, a quantity greater than in health might have escaped discovery; and that such was the case, we have some evidence in the increased amount of uric acid, which, when suspension of the urinary excretion takes place, is found in excess in the blood along with the urea, and can be more easily discovered, not being so liable to suffer decomposition; still the urea was not in large excess. In these cases, death took place during the stage of collapse. In Case III it will be also observed that no urea was found, but Dr. Parkes remarks, that it may have been present in small quantities, but certainly *not in large excess.* The blood in Case IV was not examined for this principle. In Case V, urea was sought for twice; first, when the patient was in a state of partial collapse, next, in the blood obtained from the large vessels after death; and it will be seen, that in the collapse stage (not intense) 1000 parts of blood contained 0·38 part of urea; after death (partial reaction having taken place), as much as 0·92 part was found in the same quantity of blood. In Case VI, where the blood was taken after death, the patient having had partial reaction, and then becoming semi-comatose, 0.65 part of urea was obtained from the 1000 parts of blood; and, lastly, in Case VII, where reaction had been restored, and the patient was suffering considerably from head symptoms and fever, the 1000 parts of the serum of the blood taken during life, yielded 1·14 parts of urea. So we find that the urea gradually increases in amount, from the cold stage to that of febrile reaction. The explanation of this phenomenon is, I think, exceedingly simple; for I should imagine, that in intense and sudden collapse, not only is the function of the urinary excreting organ diminished or suppressed, but also the vital metamorphoses, and therefore the formation of urea, are likewise nearly suspended. This would account for the small amount usually found in the collapse, and probably the quantity varies inversely with the intensity of this state; but when partial reaction ensues, and the vital changes take place with greater activity, should the function of the kidneys not be at the same time restored, urea must accumulate in the blood, and the amount must depend on the degree of the reaction (febrile or not), and the extent of suppression of the urinary secretion. This view is certainly supported by the results which have been as yet obtained, not only recently by ourselves, but also in the former epidemic by Dr. O'Shaughnessy and others.

CONCLUSIONS.

In comparing the recent analyses with those given in the first part of the paper, it will be seen, that as far as concerns the physical properties of the blood, the diminished amount of water, and the consequent increase of the solid portion, also the high specific gravity of the

serum, and its tendency to become less alkaline, our own conclusions perfectly agree with those previously made; and therefore, that conclusions 1, 2, and 3, before given, are thus far confirmed. With regard to (4) and (5), concerning the salts and urea, our conclusions must be—

4. That, in Cholera, the saline constituents of the blood are not only not decreased in amount, but sometimes exist even in increased proportion, and that the diminution of its alkaline reaction is not due to the loss of salts, but to the impeded excretion of organic acids, which are constantly being formed in the system.

5. That urea usually exists in increased quantities in Cholera blood, but that the amount differs considerably in the different stages of the disease; being but small in quantity in the intense stage of collapse, increasing during reaction, and in excess when consecutive febrile symptoms occur.

From what we have ascertained as to the alterations which take place in the blood in Cholera, we shall have little difficulty in solving the problem proposed in the early part of our paper—"Given a specimen of blood, to determine whether it is derived from a patient suffering from Cholera." For it will be seen, from the several conclusions we have drawn, that in this disease the blood undergoes changes, not observed in any other morbid state of the system; and should a specimen of blood be found possessing the characters described under the conclusions 1, 2, and 3, (Part I), no doubt can be entertained as to its being derived from a Cholera patient; and we can determine, to a certain extent, the stage of the disease, by examining it, with regard to the points in conclusion 5, (Part II).

There are certain points, with regard to the pathology and therapeutics of the disease, which the consideration of the results of the chemical examination of the blood and other fluids naturally suggest to the mind. In the first place, it would appear that the Cholera poison, when introduced into the blood in sufficient quantities, causes an intense exosmotic action of the mucous membrane of the alimentary canal, at the same time destroying its endosmotic power. The blood therefore being deprived of a certain amount of water and salts, by the intestinal evacuations, and, not possessing the power of regaining these by absorption from the stomach, becomes altered in the manner we have seen, and ill suited for circulation in the extreme vessels; thereby giving rise to suppression of the various excreting functions, by which in turn it is rendered impure. But a question now arises, is this condition of blood essential, and cannot the stage of collapse be induced by the direct influence of the poison? There are certain cases known by the name of "Cholera Sicca", which would seem to favour this latter view; but from what I can ascertain, no analyses of blood have been made in such, and as far as my own experience goes, the amount of intestinal evacuations in any case is by no means an indication of the extent to which the blood has become altered. This is also well shown by the condition of the blood in severe bilious diarrhœa, in which its specific gravity appears to remain unaltered, the endosmotic or absorbing power probably remaining entire. Supposing this latter property entirely suspended, it would require but little amount of intestinal evacuation to cause this condition of blood; the loss of water by the skin and lungs would alone

soon produce it; and that this power is sometimes lost will be seen in examining Case 5 (Worts), in which, although many gallons of water were taken into the stomach, the blood still continued to increase in specific gravity.

Assuming that such a condition of intestinal mucous membrane exists in Cholera, it gives us but little hopes of effecting much by remedies administered by the mouth, during the collapse: and experience has shown us, that very little confidence can be placed in them. The saline drinks, recommended by Dr. Stevens, must here fail, as even water is unable to be absorbed. This led to the method of injection of saline fluids into the veins; and certainly it appears that, even in the most intense stage of collapse, patients may, for a time, be restored by their employment. Unfortunately, however, the improvement has, in most cases, proved but temporary; but still enough has been seen, to cause many to think that their use is strongly called for. Should they be ever again employed, I think that more attention should be paid, both to the nature and quantity of the salts contained in the fluid, than has hitherto been done; and a solution should be employed whose composition resembles, as much as possible, the portion of the blood which has been lost. One would be apt to think, that the blood could not bear with impunity a considerable quantity of carbonate of soda in place of the phosphate; yet such a substitution, I believe, has generally been made. May not the use of improper fluids have been in part the cause of the truth of the remark quoted by Dr. Watson, in his Lectures on the Practice of Medicine, that, "However it might be with pigs and herrings, *salting* a patient in Cholera was not always the same thing as *curing* him."

Might not some agent be injected, which would tend to prevent the exosmotic action of the intestines? Certain bodies, possessing such a power on membranes, have been found. When reaction takes place, and the watery portion of the blood becomes restored, it would then seem rational to employ drinks containing small quantities of the salts; for it does not seem improbable, that the saline deficiency, which must then occur, unless supplied, may tend to prevent the due action of the kidneys and other excreting organs. At this time also, other remedies, as calomel, etc., should be given, with the intention of restoring the excretions.

63, Harley-street, March 31st, 1849.

OBSERVATIONS ON CREEPING BUBO,

ILLUSTRATED WITH CASES.

By SAMUEL SOLLY, Esq, F.R.S., Senior Assistant-Surgeon to St. Thomas's Hospital, etc.

The various aspects which Syphilis presents in its primary and secondary phenomena, and the way in which those aspects are modified by the action of medicines, have given rise to the most contradictory systems of treatment. It may be safely affirmed, that there is no subject, in the whole range of surgical pathology, on which surgeons are less agreed, than on the treatment of syphilis. The true Hunterian

chancre is seldom seen presenting the same clear, bold, and decided character, which the Father of British Surgery so graphically delineated; but there are innumerable sores—the result of impure connexion—which are equally syphilitic, and which require the use of mercury to prevent all those effects, of which, if unrestrained, they are but the *avant couriers.*

The number of the cases of secondary syphilis, which are now daily met with, must, I think, be painfully obvious to every reflecting and conscientious surgeon. No one, who has extensive opportunities of observing this disease, either in private or public practice, can deny that such cases are on the increase. This increase, I believe, has arisen from the adoption of a too indiscriminate plan of *non-mercurial* treatment. Some years ago, it used to be considered a disgrace to a surgeon, if secondary symptoms made their appearance; and he was held responsible for such a result. But it appears, in the present day, that surgeons regard it as an accident which may occur to any one. Of this they are quite certain, that if they err, they err in good company. It is true that those horrible cases of syphilis, in which the bones of the head and face were destroyed by slow but undeviating steps, are not so frequent as when mercury was employed more abundantly than at present. But those dreadful ravages may be regarded as the result of the abuse of mercury, in combination with the debauched and intemperate habits of the patient, and not as the necessary effects of this invaluable mineral.

The object of this paper is not to advocate the use of mercury in all cases of decided syphilis, but to point out the advantage of using it carefully in one peculiar form, which this destructive malady occasionally assumes. I must, however, take this opportunity of saying, that I believe mercury is the only safe and certain remedy which we possess for the cure of syphilis, either in its primary or secondary stages; and when its use is once decided on, it must be employed strictly and firmly, not allowing the patient, whatever his rank or circumstances may be, to suppose, for one moment, that he is the subject of a slight disease, or of one from which he will speedily recover by a little simple treatment, which will not interfere with his general health or usual habits of life. I believe that it is the duty of the surgeon to state distinctly to his patient, that the poison, which has entered his blood, will not confine its effects to the spot where it first appeared, but will pervade the whole system, making shipwreck of his constitution, if he do not aid the surgeon, by temperance and sobriety, in every sense of the words. I am induced to speak thus strongly on the subject, because I see daily the difficulty, in which the conscientious medical practitioner is placed at the present time, from the unsettled state of professional opinion on this subject. When I find such men as Astley Cooper, Brodie, Travers, Colles, Lawrence, Copeland, Green, Bacot, and Ricord, recommending the use of mercury, I am surprised that the question of its employment should still be so unsettled. The last-named surgeon, Ricord, says (Drummond's Translation, p. 287): "The surgeon, who leaves an indurated chancre without general treatment, is, in a measure, responsible for the consecutive symptoms; and mercury is by far the most prompt and efficacious in its action. If a mercurial treatment be indicated, it ought to

be pursued till the symptoms disappear." I must not, however, dwell longer on the general treatment of syphilis, but proceed at once to that form of the disease, to which I wish to direct the attention of the profession.

Venereal Buboes have been divided by some writers into different kinds, depending principally on the constitution of the patient and his habits of life. For instance, if a man in robust health, with a plethoric constitution, accustomed to a stimulating diet, contract syphilis, and go on living in just the same way, he will most probably have a bubo in the groin, which will run its course rapidly: this may be termed *Acute Syphilitic Bubo.* In another case, where the temperament is quiet, or, rather, inclined to be sluggish, the patient's habits temperate, and a gland in the groin becomes inflamed, it is usually the consequence of a chancre, which has existed for some time, either from neglect on the part of the patient, or inefficient treatment on the part of the surgeon; this may be designated *Chronic Syphilitic Bubo.* In strumous constitutions, the glands in the groin will inflame with much less irritation, than in more robust systems. Much slighter causes, than are sufficient to produce acute bubo on the one hand, or a much shorter persistence of the poison in the system, than will excite chronic bubo in a non-strumous individual, will excite, what may be termed from this circumstance, *Scrophulous Bubo.* The surface of a bubonic abscess, like the surface of any other abscess situated in a very moveable part, will occasionally slough, if it be subjected to rough treatment; and hence the title *Sloughing Bubo*, which is only mentioned now to distinguish it from phagedænic bubo. *Phagedænic Bubo* differs materially from the sloughing bubo: *First*, in the absence of acute inflammation; *Secondly*, in the character of the constitution in which it appears—the debauched and debilitated. It occurs especially in the lowest class of prostitutes, who have been compelled to pursue their calling under the continued stimulus of gin. The sloughing bubo readily yields, in most cases, to perfect rest, purgatives, and simple local antiphlogistic measures. But not so the phagedænic bubo; when once this form of ulceration has commenced, its ravages are awful, for the depraved condition of system, which brought it into the world and feeds it, is not easily corrected. It is a gangrenous ulceration; a process in which both destructive operations appear to act simultaneously and in combination.

These classifications have been adopted by most writers on syphilis, but I do not find that any *generic* title has been given to the form of bubonic ulceration to which I now wish to direct attention, though its peculiar appearance has not escaped observation, as I shall show further on. If true *chronic syphilitic bubo* proceed to ulceration, unstayed by mercury, it assumes a most serious and intractable form, which I have designated, from its most prominent feature, *Creeping Bubo.* I believe, that by some surgeons it is designated *chronic phagedænic*, but I do not think that the term phagedænic should be applied to any ulceration, where the sloughing or gangrenous action is absent, notwithstanding the etymology of the word.

It frequently happens, that a patient presents himself with a bubonic ulcer in the groin, but without either any ulcer on the penis, or gonorrhœa. In such cases, it is of great importance to ascertain, whether such ulceration be syphilitic or not. If the history be, that he has

only had gonorrhœa, and there be no cicatrices of former sores on the penis, there is little difficulty in the diagnosis. But it more frequently occurs, that there has been a sore of some kind or another, preceding this ulceration. The ulceration following gonorrhœa, or any other simple source of irritation, generally heals kindly, and the patient remains under the practitioner who first treated him; but it is not always so with the syphilitic. I have occasionally met with cases where the original chancre has healed without mercury, leaving behind it a bubo, as truly syphilitic as the original chancre. I have also seen cases, in which the chancre has been healed under the influence of mercury, and still a bubonic ulcer has been left behind.

Ulceration in the groin, following syphilitic inflammation of an absorbent gland, is often a most intractable kind of sore. I believe that it scarcely ever heals, without the employment of mercury. If its true character be recognized, when the surface which it occupies is small, and but a short time has elapsed from the first absorption of the poison, it is easily arrested by mercury. But if it has attained any size, and the system has been for some months under the influence of the poison, then it is one of the most difficult sores to heal, in the whole range of surgery. It is then a long while before this mineral will arrest its ravages; and it is often necessary to desist from the use of mercury for some time, employing tonics, and returning to it again.

If my views regarding this treatment be correct, it is unnecessary to dwell on the importance of distinguishing its character at the onset. This disease, in its most aggravated form, when it has existed some time, unstayed by mercury, presents a very peculiar appearance, by which it is easily distinguished. Its most striking feature is the manner in which it burrows under the skin, creeping onwards from place to place. This creeping character has induced me, for some time past, to designate it in my clinical observations, as *Creeping Bubo*. It often creeps upwards on the abdominal parietes, as high as the umbilicus; down the thigh, as low as the knee; round the thigh, to the anus; and over the buttock, nearly to the spinous process of the ilium.

The formidable nature of this ulcer is best seen in those cases, where no mercury has been administered; for, in these, there is scarcely any attempt at the healing process. Some years ago, I had an opportunity of witnessing several cases of this kind occurring about the same time. Their extreme obstinacy astonished me. I saw every local application in the Pharmacopœia tried, but in vain. Mercury was not made use of, and they continued to extend, One case sank under the disease, apparently exhausted by its depressing effects.

The appearance which Creeping Bubo exhibits in its *early* stage, presents some peculiarities by which it may be distinguished. The surface of Creeping Bubo is of a yellowish colour, the discharge is thin and ichorous, the edges are inverted, overlapping, corrugated, in dotted points, white, hard, and very irregular. In its early stage it is most like the strumous or scrophulous bubo, with its overlapping edges; but it differs, inasmuch as the edges of the strumous bubo are inverted, not everted, and soft, not hard and corrugated. The distinguishing marks, however, are not so easily described by the pen as by the pencil.

I was at first much surprised, in searching the records of surgery, to

find so few clear and distinct notices of this formidable effect of the syphilitic poison. This most probably arises from the fact, that mercury was so extensively, and, as I believe, judiciously used in former days, that the poison seldom remained so long uncontrolled, as to produce the form of ulceration in question.

Swediaur[1] dwells, with his characteristic force, on those phagedænic and also scrofulous buboes, in which mercury is contra-indicated; but he does not describe any form of bubo which especially requires this medicine.

Mr. Pearson, in his Lectures on Syphilis, used to speak of this form of Bubo in the following manner:—"Instead of bubo healing after the completion of a mercurial course, it sometimes happens, that a very painful ulcer remains, which occasionally spreads to the external part of the thigh, and in a contrary direction as far as the scrotum, or even to the anus. The ulcer is ill-conditioned, and attended with bad health, often resisting every mode of treatment that can be tried."

Mr. P. has encouraged the suppuration of the part; but, though it has poured out a greater quantity of matter, it has shewn no disposition to heal. He has used the actual cautery, has applied cicuta, oxymuriate of mercury, bark, sarsaparilla, and myrrh, without any perceptible advantage; in many cases he has given internally cicuta, sarsaparilla, opium, bark, decoctum Lusitanicum, muriate of baryta, chalybeates, compound lime water, blue and white vitriol, without essential benefit to the patient. He has recommended the patient to take chiefly raisins, and decoction of guaiacum; has varied the diet in every possible way; has tried the effect of pure air, exercise, rest, and confinement, but no particular advantage has ensued. Great attention, he says, must however be paid to the general health; the sore should not be stimulated, but kept easy without being relaxed. That mode of treatment is the most efficacious, which gives the least pain. The warm sea-bath, good air and exercise, with generous diet, promises most success. The cure must be effected by the efforts of the constitution. He says, "sometimes, when a bubo is nearly healed, it becomes changed into an ill-conditioned sore, with jagged irregular edges; the ulceration begins to extend from some part of the ulcer, attended with a sensation of pruritus or tingling; and, though small at first, will spread so rapidly, as to reach almost across the body. The aspect of the sore is foul and irregular; its edges jagged and flabby, resembling a leaf that has been injured by caterpillars; when it occurs on the penis, it will sometimes extend to near the area of the pubis, entirely or partially, destroying the integuments. In these cases, the patient's ease must be consulted. Mercury will generally do considerable harm; muriate of barytes and sarsaparilla have been found most useful. The cure depends on the powers of the constitution, and the patient may ultimately do well. It is seldom very painful. Mr. P. has known the sore to run down the thigh to a great extent; he relates one case in which the disease lasted

[1] F. Swediaur, M.D. Traité complète sur les symptômes, les effets, la nature, et le traitement des Maladies Syphilitiques. 4me Ed. 1801. A Comprehensive Treatise upon the symptoms, consequences, nature, and treatment of Venereal or Syphilitic Diseases; translated from the seventh French edition of F. Swediaur. 1819.

seven years. "These sores, he says, "will frequently baffle all your attempts. Do nothing to irritate: keep them clean and easy by ointment, containing the extract of lead, calomel with lime water, decoction of guaiacum; and these will keep them dry and easy. The cure depends on some particular and inexplicable change in the constitution; and when this has taken place, the sore will generally heal in a very short time." Mr. P. used to advise his patients to take no notice of it, but to go about as usual. One gentleman, with such a sore, took a tour of the Highlands!

That admirable champion of mercury, the late Dr. Colles, of Dublin, has noticed this disease, denominating it the *Horse-Shoe Ulcer*. He says, that "mercury, in general, does not serve this symptom; yet, in some cases, very minute doses of mercury will be found most useful in disposing the ulcer to heal." He then relates a case, which forcibly supports my views of the importance of the mercurial treatment; and affords decided encouragement to those who are disposed to continue its use, even under the most discouraging circumstances. (*Colles on the Venereal Disease*, p. 104.) Colles, however, does not say that these ulcers cannot be cured without mercury. On the contrary, he says, "I have seen them yield, though slowly, to other treatment, and I have known some to have been made worse by the use of mercury." With all this I agree; but I am convinced that the cases, which are not benefited by mercury, are the exception to the rule, and are very few in number, and then only *when they have existed for a long time.* That mercury is the most powerful instrument we possess to arrest the disease, I can confidently assert, as the result of above fifteen years careful observation. I believe that the sore scarcely ever attains any great size, if mercury has been judiciously and efficaciously administered, at the *onset* of the disease.

My attention was first called to this subject by my late valued friend Mr. Tyrrell. He considered, that nothing but mercury had any control over it. His observation made a great impression on me, because he was not in the habit of using mercury extensively, and he always desisted as soon as the primary sore, for which he ordered it, was healed.

In this form of syphilis, as in many of those truly called secondary, mercury is very useful up to a certain point; beyond which it disagrees with the system, making it necessary to abstain from it for a time. But, by waiting a few weeks, or even months, we may return to its use; and its efficacy is again exhibited, in the rapid improvement of all the symptoms.

I will first relate some cases, in illustration of the extreme obstinacy of this form of ulceration, when mercury has not been steadily and judiciously administered. There are very few of our hospital syphilitic patients, who do not assert that their mouths are sore from mercury, long before they really are so. I now never trust to their words, but I examine carefully the condition of the gums. In the three following cases I was deceived into the belief, that the mercury was not arresting the disease, and was therefore useless, when it really had not been thoroughly absorbed. I therefore abandoned its use too soon. I am also convinced, that the beneficial effects of a mercurial course are very often delayed and intercepted, by giving large quantities of what in hospital

language is called support; but which really stimulates and excites, producing fever, not strength. Most of our hospital patients are men who have been addicted to the use of ardent spirits, and large quantities of porter. They are bad subjects for a mercurial course. They generally require a small proportion of their usual stimulants; but they must be given sparingly, otherwise their action will interfere with, and mask the operation of mercury, so as to render it impossible to judge correctly of its operation.

Case 1. *April* 8th, 1842. A. P., æt. 25, shopman to a grocer, consulted me, with two chancres on the penis; one on the glans, and one on the external surface of the prepuce. He says that he has had them five weeks: that they came with a pimple. He has also a bubo in the groin, the surface of which is red, and it evidently contains matter. He has been under treatment four weeks, but is not aware that he has had any mercury. The sore on the glans penis is on the side of the frænum, small; that on the prepuce is larger, with irregular edges, but without a hardened base. Infricetur unguenti hydrarg. ʒ i omni nocte. 12th. Sores not altered. A pustular eruption has appeared on the thigh, from the rubbing in. To leave off the ointment and apply lotio plumbi. ℞ Hydrarg. chlorid. gr. i, opii gr. ss, ol. carui m. i M. Ft. pilula, nocte et mane sumenda. 13th. Sores much the same; healing at one point, but not healthily. The lotion was applied by mistake to the penis. Mouth not affected. Calomel to be increased to gr. ij. in each dose. 15th. Mouth still unaffected; no indication of the effect of mercury. Sores dry but not healing. Cold water the only application. ℞ Hydrargyri chloridi gr. iij, pulv. capsici gr. i, olei carui m.i. Fiat pilula statim sumenda, et horâ somni repetenda, nisi priùs alvus soluta fuerit. 16th. Mouth tender; submaxillary glands sore. Has taken one pill; to continue calomel and opium. 19th. I opened a large suppurating bubo. 27th. Sore nearly healed: bubo granulating; presents a tolerably healthy surface. Sumat calomelanos gr. i mane, alternis diebus. *May* 5th. Sores healed; very little hardness remaining: bubo unhealthy, presents an excavated appearance. To continue the calomel as before, and to take a mixture containing iodine, gentian, and fluid extract of sarsaparilla. 7th. The bubo is so extremely unhealthy and more excavated, the skin surrounding it of so deep a purple hue, and his general health so much affected, that I ordered him to live well, and discontinue the calomel; and to add to each dose of the mixture two ounces of decoction of sarsaparilla. 13th. Bubo very indolent and unhealthy: touched with tinct. of iodine: he was ordered also to apply the ung. hydrarg. nitrico-oxydi. 24th. He has been at Gravesend for a week. The bubo is still very sluggish and unhealthy. Being now convinced that the unhealthy character of the bubo was not from debility of constitution, but from the poison of syphilis, I ordered the strong mercurial ointment to be applied. 30th. Very slight improvement. I ordered him to leave off the medicines. and to take, night and morning, a pill containing one grain of calomel and half a grain of opium. *June* 28th. Progressing very slowly. I ordered to be taken, night and morning, a pill containing two grains of blue pill, one grain of calomel, and half a grain of opium. *July* 18th. Has continued the mercury since the

last report. The mouth has been slightly affected all the time: the original ulcer of the bubo has healed, but small ulcerations have commenced at the edge of the old cicatrix. The mercury to be continued. *August* 4. To take two pills at night and one in the morning. 16th. Mouth very sore: bubo healing. 19th. Mouth very sore: omit mercury internally: continue to apply the ointment to the sore. 22nd. Mouth a little better: sore healthy. ℞ Hydr. bichloridi gr. i, decoct. sarzæ lb.ij., extracti ejusdem ʒss. F. mistura. A tenth part of this mixture to be taken thrice daily. 25. Better: continue medicines. Apply zinc ointment. *September* 7th. Not so well: sore unhealthy. ℞ Hydrargyri chloridi gr. ij, pilulæ hydrargyri gr. ij, opii gr. i. Fiat pilula, nocte et mane sumenda. Bis die sumat decocti sarzæ lb.ss., cum extracti sarzæ ʒi. 14th. Bubonic sores very unhealthy. ℞ Hydrarg. iodidi gr. ss., opii gr. i. Fiat pilula, nocte et mane sumenda. Pergat in usu sarzæ. 19th. Bubonic sores much more healthy; increase the dose of iodide of mercury to gr. i. 24th. Improving: one sore has been touched with tincture of iodine. 26th. The tincture of iodine has appeared beneficial, and is to be repeated. *October* 7th. Sores quite stationary: to leave off the iodide of mercury, and to take the following: ℞ Hyd. chlorid, gr. ij, opii gr. ss. Ft. pilula ter die sumenda. 14th. Very little progress: mouth very sore. To have a purge; to leave off the calomel, and apply the following ointment:—℞ Hydrargyri chloridi ʒi; pulveris opii ʒss; cerati cetacei ʒi. M. Fiat unguentum. 18th. Rather better; to continue the ointment, and to use a gargle of chlorinated soda. *December* 10th. The sores, which have been gradually creeping over the symphysis pubis, now nearly healed: mouth very sore. To continue the mercury. *January* 23rd, 1843. Mouth tender: has continued the mercury; but the sores are not yet healed. As the mouth is not much affected, to take the following:—℞ Calomelanos gr. iij; opii gr. ss. Ft. pilula nocte et mane sumenda. Continuetur sarza. *February* 4th. Sores nearly healed. 15th. The mercury has been continued, and has produced profuse salivation, but the sores have not improved. He is suffering much from sickness. To leave off the mercury, and to take no medicine for the present. 18th. Sores rather larger and very sore. Ter die sumat liquoris hydr. arsenicalis iodid., m. x v. *March* 2nd. Sore larger and more unhealthy. Omittatur liquor hydr. arsen. ℞ Hydrargyri chloridi gr. ij; opii gr. ss. Fiat pilula ter die sumenda. 7th. The ulcer has diminished in size; but, in consequence of his walking, the discharge has irritated the surrounding skin, and brought out a slightly pustular eruption. Mouth sore. 24th. Sore looking healthy, but not smaller. To take two instead of three pills daily. *April* 4th. Mouth very sore, profuse salivation; but not much progress in the ulcer. The yellow lotion was prescribed: and he was ordered to take half a grain of the iodide of mercury, thrice daily. 12th. Mouth rather easier: sore better. *May* 9th. Much better: sore nearly healed; mouth not tender. The dose of the iodide of mercury was increased to one grain. 16th. Better. He was ordered to take two grains of calomel, with half a grain of opium, every night, and to continue the iodide of mercury. 18th. The iodide of mercury has been omitted by mistake, and the wounds are not so well. *June* 2nd. Mercurial inunction ordered. 28th. Has continued rubbing in; and is nearly well. He thinks that the

rubbing in agrees with him better than anything else. To continue the mercurial inunction. *July* 6th. Better. 8th. Showed me an eruption on the chest and abdomen, which, he says, has alternately appeared and disappeared for six or seven months. It is simple lichen. 12th. Wounds stationary. To continue mercurial inunction every other night. One of the sores has been touched with nitrate of silver. 20th. Wounds healed. Mouth still tender. *August* 30th. He has been taking sarsaparilla, but has omitted the mercury, and has remained perfectly well since the last report.

In reviewing this case, I cannot but regret that I did not pursue the mercurial plan of treatment with greater decision and severity in the first instance; I wavered in my purpose, more than I shall ever do again. Of this I feel certain, that if I had not carried on the mercurial course as I did at last, the bubo would have still remained unhealed; and that, if I had not given it at all, it would have assumed a still more unfavourable appearance. There is another practical point which this case illustrates, viz., the superiority of the use of mercury by inunction, over its administration by the mouth. When this disease is first influenced by mercury, it is curious to observe, how it will still keep travelling on, before you can entirely arrest it. In the case just related, on the 4th April, the ulceration had cicatrized in the groin, but it continued to travel over the pubis; and before it had healed, it had reached the opposite side of the pubis. The action of the mercury was evidently interfered with, by the too early exhibition of sarsaparilla. I was also deceived by the assertion of the patient, that his mouth was sore, long before his system was really affected by mercury.

Case II. The following case is instructive, though I cannot give its termination. George Foster was admitted into St. Thomas's Hospital on the 14th *June* 1842, under my care, with chancre and bubo. The bubo was unhealthy (but not exhibiting the creeping appearance), and his general health was very much impaired. ℞ Hydrargyri chloridi gr. ij; opii ss. Fiat pilula. Carrot poultices to be applied to the bubo. The calomel was only continued a week, and quinine was given instead. He had also meat daily, with porter. After a short time, calomel was again administered.

August 11th. The same treatment was continued, but without any improvement. *November* 10th. The ulcer had extended on its circumference, and cicatrized on the interior. On the 1st of *July* 1843, he commenced mercurial inunction; on the 12th his gums became affected, and on the 16th the inunction was omitted. For fifteen months he took no medicine, but he had porter and brandy. The disease, in the mean time, kept advancing on the circumference, and cicatrizing in the centre. The local remedies were varied from time to time; that which appeared to suit it best was unguentum hydrargyri cum opio. On the 2nd of *November*, he was moved to a convalescent ward. At this time I made the following note: "In front, the disease has nearly disappeared; the lower part of the abdominal muscles, and the upper third of the thigh, is occupied by an enormous eschar, which is corrugated, like that left by a burn. At the extreme points, superiorly, and inferiorly, are ulcers about the size of a half-crown; the superior over the spinous process

of the ilium, the inferior at the lower part of the upper third of the thigh. Posteriorly, there is a large eschar; and at the superior part over the crest of the ilium, the ulceration still exists in the form of a horse-shoe, and also on the nates on both sides." I now gave him two grains of disulphate of quinine twice a-day; and on the 19th of December he left the hospital, improving, though not well. The change of air, however, benefited him very much, and he got well in about two months.

Case III. This case was also tedious, from not adopting the simple mercurial treatment. Edward White was admitted into St. Thomas's Hospital on the 24th of *January* 1843, with a sinus in the groin; he had also pains in his limbs. He was ordered to take the iodide of potassium and sarsaparilla. On the 18th of *Februavy* he commenced rubbing in mercury, but this was not continued more than a week, and he was then ordered sarsaparilla and nitric acid, with meat and porter daily. He came under my care in July, and was in the hospital a year and a half. I at first employed mercury by inunction, and gave him porter, etc. (but did not continue it very steadily), with quinine, from which he certainly derived benefit for a time. Calomel, with opium, was also given with advantage. When he left the hospital, the sore had healed at the upper part, but not at the lower. He continued under my care as an out-patient, taking the iodide of potassium for two months; at the end of which time he was quite well.

Case IV. George Leach, æt. 28, a stout hearty-looking man, a navigator, who had been working at the Dieppe and Havre Railway, was admitted into St. Thomas's Hospital on the 21st of *February* 1843, with an extensive ulceration and deep sinuses in the groin, and ulcerated sore throat. He stated that he had worked hard and drank hard; earning good wages, and wine being very cheap. He was ordered to rub in, to take decoction of sarsaparilla, to use muriatic acid gargle, and apply black wash and poultices to the groin. The mercury was soon discontinued, and sarsaparilla given instead.

He came under my care on the 5th of *July*. I immediately ordered him to rub in; this he continued for three weeks, but I was obliged to substitute calomel and opium for the inunction, in consequence of the irritation which the ointment produced on the thighs. The mouth was slightly sore for five months; the ulceration extending at the edges, but cicatrizing in the centre. During this time he had porter and brandy, with meat, daily. The mercury was now abandoned, and sarsaparilla substituted. *November* 10th 1843. From this time I varied the treatment, giving wine, iodide of iron, quinine, infusion of gentian, cascarilla, Fowler's solution, and cusparia. On the 4th *November* 1844, I resumed mercury in small doses, and the disease healed slowly, in about three months.

Case V. William North, æt. 25, was admitted, on the 23rd *Nov.* 1842, into St. Thomas's Hospital, with an extensive superficial sore in the groin, about the size of three half-crowns, and presenting all the characteristics of Creeping Bubo. He states, that he had a chancre

about two months ago, which was succeeded by others in succession, round and beneath the corona glandis. He was in Guy's Hospital for only eight days. At that time he had one chancre, and a bubo, which was opened. He never took mercury sufficiently to affect his mouth, and left the hospital with an open bubo and chancre unhealed. The chancre healed gradually; but the bubo went on extending from three different points. He had not had any venereal eruption; but he had suffered from pains in his limbs and sore throat, for which he took iodide of potassium and sarsaparilla. I ordered him immediately on his admission, ℞ Calomel anos gr. ij; opii ss.; Fiat pilula nocte et mane sumenda; black wash to be applied to the ulcer. I gave him no stimulants. His mouth soon became affected under the mercury; and the sore healed in one month from the date of his admission.

Case vi. The following case occurred in my private practice, and illustrates the value of mercury, and the importance of its steady administration; though, I have no doubt, the case would have been far less obstinate if mercury had been properly and steadily administered in the first instance. On the 5th of *February* 1846, I saw the patient, in consultation with Mr. Harris, of Fenchurch-street, suffering with an extensive Creeping Bubo in each groin. His complexion was very fair, and his appearance rather indicative of a strumous diathesis; but he stated that he has always enjoyed very good health; that his habits have always been temperate; and that he was never intoxicated in his life. *History.* On the 8th of *November* 1845—that is, eight days after intercourse—he found that he had got gonorrhœa, and some sores at the extremity of the penis, for which he took copaiba and applied the lotio plumbi. On the 19th, the sores presented such a decided syphilitic character, that his medical attendant determined to give him mercury. Omni nocte sumat, pil. hydrarg. gr. ij; to take a mixture of iodide of potassium, and to use a lotion of nitrate of silver. On the 26th, he was ordered to rub in, as the blue pill purged him. The inguinal glands had just begun to swell. On the 28th, leeches were applied to the groin. On the 29th, he was ordered to take sarsaparilla with five grains of the iodide of potassium. He only continued the rubbing in for four nights, in consequence of the irritation of the skin of the thigh. The mercury was not therefore continued more than eight days, and his mouth never made tender. On the 16th of *December*, one bubo was opened; and on the 24th, the other. During this time he had continued the sarsaparilla and iodide of potassium. The buboes were poulticed, but they gradually assumed an unhealthy sloughy appearance, for which nitric acid was applied, but without effect. About the end of December, he consulted an eminent hospital surgeon, who made some local application, and ordered him sarsaparilla, and opium at night. On the 5th of *February* I first saw him. I told him that he had a most intractable form of syphilitic disease; and that nothing but entire rest, strict temperance, and a mercurial course, carried on for at least ten or twelve weeks, would have any effect on it. I ordered him to rub in the ungientum hydrargyri fortius, and take gr. iss of quinine for a dose. This time he managed his rubbing in better, and no rash followed. I desired him to keep his bed; but he only complied with this

direction for about a week. He improved, however, very decidedly. He continued the mercury only one month, when he left town on business, and for some time pursued no regular plan of treatment. On his return to town, he used the unguentum hydrarg. nitrico-oxydi; but on leaving town, the creeping ulcerations recommenced with fresh power; and on applying for surgical advice in one of the provincial towns, he was told that he had been badly treated. He says—"The surgeon undertook my cure by the application of simple ointment, and also balsam of Peru, sulphate of copper, and nitrate of silver; together with a variety of medicines, as decoctions of bark, and rhubarb. He enjoined perfect rest; but in two months I was no better. I then applied a red ointment to the affected parts, and took mercurial pills, until the gums were made sore. I then discontinued them, and applied other forms of ointment for another month, but no benefit resulted: the ulcers, if any thing, still spreading. I then applied the chlorinated soda lotion, with much relief to myself, and a great improvement in the aspect of the sores. I then returned to London, after having kept my bed 116 days. In a short time, the ulcerative process was again set up, the chlorinated soda lotion having apparently lost its effect."

He again consulted me, saying that he had spent all his money, and that he should feel obliged if I would admit him into the hospital. He was accordingly admitted on the 23rd of *November*, 1847, and his condition is thus described by my dresser, Mr. Bull—"There is an indolent unhealthy Creeping Bubo in each groin; that in the right groin is irregular in shape and extent, with indurated, serrated, and everted edges, extending upwards from the origin of the gracilis, obliquely across the pubis (but without implicating the penis) into the inguinal region in the line of Poupart's ligament. Its width, superiorly and inferiorly, is from a quarter of an inch to three inches; and its whole length nearly six. The ulcer is deepest at the base of the penis, being there at least half an inch in depth. The ulcer in the left groin likewise extends, from the origin of the gracilis, upwards and obliquely across the pubis, into the left inguinal region, in the course of Poupart's ligament; it is about six inches in length. It is much narrower than the bubo on the opposite side. The surfaces of both are very unhealthy, discharging a sanious acid pus in small quantity. He complains of an aching pain around the sore, increased by exercise. His look is care-worn, and his health impaired by anxiety of mind." I ordered him to rub in a drachm of the strong mercurial ointment every other night, to keep his bed, and apply the lotio sodæ chlorinatæ to the buboes, so as to keep them thoroughly cleansed from discharge. 27th. The sores are cleaner and more healthy. *December* 3rd. The lotio sodæ chlorinatæ seems too strong, and irritates the sores. To be diluted. 5th. Leave off the lotion, and apply unguentum hydrargyri nitrico-oxydi to the ulcers. 10th. Surface of the sores granulating kindly; and beginning to heal. *January* 24th, 1847. Up to this time the aspect of the sores has been most favourable. The ulcers have nearly healed, but there still remains a deep sinus near the pubis, about the size of a halfpenny. He has continued to rub in every other night, since his admission, which has kept the mouth slightly affected. His diet has been principally farinaceous, with milk, and a little meat occasionally.

February 1st. The ulcer on the left side is quite healed; that on the right side does not improve. He was ordered to discontinue the ointment of nitric oxide of mercury; and to use zinc ointment instead. 12th. Complains that he cannot sleep at night. Sumat opii gr. i omni nocte. A few days after this date, he left the hospital to attend to some business matters, which I afterwards learned had been making him very anxious; and I have not seen him since. I understand, however, that he sailed for Portugal, very soon after quitting the hospital.

Case vii. The following is the next case that I had under my care; and the rapidity with which the sore healed, I believe, may be attributed to the decided employment of mercury, unadulterated with stimulants or tonics. James Haley, æt. 48, labourer, a tall spare man, was admitted on the 2nd *August*, 1848, into St. Thomas's Hospital, under Mr. Solly, with Creeping Bubo. He states that he has always had good health, and that his habits have been temperate. There is an ulcer on the outer side of the right thigh, nearly over the trochanter major. It is about the size of a crownpiece, of irregular form, with ragged everted edges. It looks sluggish, and is of a dirty yellowish colour; the discharge is unhealthy. The ulceration has evidently spread from the groin to its present position, as there is an hardened cicatrix extending from the sore across the groin, about three inches in length. *History.* He states, that about two years and a half ago, he had several small chancres on the glans penis, which were soon followed by a bubo in the right groin. He took mercury for three or four days; but not more, the sores healing with the application of black wash and copper wash. He was living very irregularly at this time. He would not consent to the bubo being opened with the lancet, but left it to ulcerate under a poultice; since which it has never healed, during a period of two years and a half. It has been creeping on to its present position, healing on one side and spreading on the other. During three or four months, he attended very irregularly to the advice of a medical man, whose treatment was confined to local applications; for six months he was his own doctor, but he still took no medicine. For one month he was in one of the large London hospitals, where he took the iodide of potassium, black wash and zinc lotion being applied to the sore, but no mercury. The sore diminished in size, but did not heal. For the last thirteen months he has not had surgical advice, but has dressed the sore with various lotions. On his admission, he was ordered to keep his bed. The edges of the sore to be destroyed with potassa fusa; and linseed meal poultices to be applied. *August* 3rd. ℞ Hydrargyri chloridi gr. ij, opii gr. ss. Fiat pilula nocte maneque sumenda. 7th. Surface looks more healthy. 14th. Improvement very gradual. The edges to be again destroyed with potassa fusa, and linseed meal poultice to be applied. 16th. The ulcer is less painful since the application of the caustic; and looks more healthy. 20th. Gums tender. Mercurial fœtor of the breath. The sore is healing. 25th. Mouth more sore. To take the pills less frequently; but to keep up the action of the mercury. Bubo healing rapidly. General health good. *September* 3rd. Sore quite healed. Mercury has been taken only one month.

Case viii. Andrew Lappy was admitted into St. Thomas's Hospital, on *December* 5th, 1848, with an unhealthy looking bubo, which I pointed out to the students as a Creeping Bubo in its early stage. He had chancres about four months ago; there is no hardness where these were situated. The bubo appeared a month after the chancres, so that it had existed three months. It has been open six weeks. He has lived well, and has taken no mercury. To rub in the strong mercurial ointment. 24th. Much better: the mouth has been tender one week. *January* 2nd, 1849. Bis die sumat decocti sarzæ lb. ss. To use an acid gargle. 12th. Bubo quite healed. He has employed mercurial inunction for five weeks and two days.

I am perfectly convinced, that if this bubonic ulcer had not been diagnosed as Creeping Bubo, and the patient submitted to mercurial influence, that it would have ultimately attained the size and obstinate character which has been recognized by other surgeons, but has hitherto baffled their surgical skill. It fortunately happened, that I admitted at the same time another patient, with a bubonic ulcer of nearly similar extent, and presenting something the same appearance to superficial observation. I pointed out to the students the distinctive characters of each, and told them to watch the effects of the different means of treatment, as that would test the correctness of my diagnosis. The two patients got well rapidly, the one with mercury, the other without.

My object in entering thus minutely, and it may be thought perhaps rather egotistically, into the successful diagnosis and treatment of these cases is to show, that there is some practical value in the paper. I will conclude these observations, by expressing the hope that the facts and opinions now offered may be found suggestive, if not instructive.

Postscript *by the Editor.* Mr. Solly *sent to us along with his MS., a series of beautiful coloured drawings illustrative of the Essay, but which could only have been published in the Journal at an expense much beyond our means, and, indeed, at an outlay exceeding the entire cost of producing this month's number. This must be a sufficient apology for the non-appearance of the plates.*

CLINICAL OBSERVATIONS.

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No. I.—CASE OF SCARLATINOUS ALBUMINOUS NEPHRITIS, IN WHICH TWO ABSCESSES WERE FOUND IN THE LEFT KIDNEY.

PURULENT deposits are not often met with in the kidney; though, I believe, rather more frequently than some authors admit. On this point, Dr. CARSWELL, in his *Pathological Anatomy*, makes the following remarks:—"Of all the organs of the body, the kidneys are least frequently the seat of purulent deposits. The few cases which are recorded as examples of this kind, appear to have been the result of inflammation extending to the kidneys from neighbouring organs, and succeeding to the operation of lithotomy, to injuries of the spine, to the presence of calculi, and to various diseases of the pelvic viscera. We cannot, perhaps, appreciate the importance of this circumstance; but it is extremely probable, that it is to be accounted for, by the separation of the *material* cause of these depositions from the blood carried into these organs, and its excretion along with the urine."[1]

Dr. Carswell's statement requires correction. Perhaps the *non-observance*, as well as the *rare existence*, of pus in the kidney, accounts to a certain extent for the small number of published cases containing any record of such an appearance In examining the kidneys of persons who have died of continued fever,[2] I have at least twice, and I rather think oftener, seen minute points of pus profusely disseminated over the surface of the incised kidney. In both the instances to which I refer, the appearance was visible, though not strikingly so, to the naked eye; and with the aid of a pocket-glass, of small magnifying power, it was rendered very distinct. No minute microscopic examination was made, but there can be little doubt, that in such cases, the pus is situated within the enlarged tubuli; and, very probably, it is by the breaking down of the intervening textures, and the coalescing of these minute purulent deposits, that those larger collections of pus, entitled to the name of abscesses, are formed. Rayer mentions several cases of typhoid fever, in which were found purulent infiltrations, and small abscesses in the kidney.[3] The patients suffered from cerebral symptoms; but though the urine, in one case, is said to have been acid, and in another, alkaline, no account is given as to the presence or absence of albumen. This is much to be regretted: but he narrates cases of typhoid fever, in which the urine, during life, was albuminous, and in which, on dissection, the kidneys were found to be in a state of hyperæmia, a condition which must be regarded as a stage towards a nephritic affection, which might—had the patient survived, and the train of morbid actions advanced—have ended in the formation of pus. Dr. Southwood Smith mentions a case

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[1] CARSWELL. Article, Pus, in his Pathological Anatomy. 4to. London: 1838.

[2] One of the cases was true, (i.e., exanthematous) typhus, in which there was active desquamation of the cuticle when the patient died. I have no record of the eruption having been seen in the other case. In neither, I regret to say, was the urine examined.

[3] RAYER. Maladies des Reins, t. ii, p. 22, et seq. 8vo. Paris: 1840.

of a man, aged 28, who died on the fourteenth day of typhus fever, in whom the right kidney was externally nodulated, and internally healthy: the left appeared healthy externally, but when cut into, was found to contain several abscesses. In this patient there were likewise effusion within the cerebral membranes, and a tubercular state of the lungs; ulceration of the mucous membrane of the ileum and cœcum; also enlargement and induration of the liver.[1] Rayer[2] also details a case of double pneumonia, in which, at the summit of the right kidney, there was a yellow spot, which, when cut into, was found to be a small collection of bloody pus (*un petit foyer purulent et sanguinolent*). There was extensive granular alteration of both kidneys. The same author also mentions a case of cancer of the stomach, in which the patient had complained of pain, on pressure, over the loins, and in whose kidneys, on dissection, some specks of pus (*quelques grains de pus*) were detected.

Gendrin, in his *Anatomical History of Inflammations*, states, that he has met with four cases of purulent deposits in the kidney after small-pox: and the appearance seen in one of the cases (which occurred in the Hôpital des Enfants Malades of Paris) is thus described by him. "The cortical substance of the kidneys was softened, and of a deep reddish grey colour: the tubular structure could only be recognized from its being somewhat redder, of greater density, and less friability than the true glandular portion of the organ. There were as many small abscesses as cones: these abscesses were of irregular forms, about the size of lentils, and the surface of their cavities was rough, greyish, and studded with numerous brownish red points. Purulent infiltration around the abscesses was observed throughout the whole thickness of the inferior half of the right kidney: in the left, there was purulent infiltration, but no abscesses. There was no pus in the urinary passages.[3]"

Dr. Thomas Watson details a case of what appears to have been acute nephritis, arising without any ascertained cause, and terminating in suppuration. An abscess in the right kidney pointed externally. "The pelvis of the kidney was much dilated; and the substance of the gland destroyed, to a considerable extent, by suppuration and ulceration. The ureter, where it left the kidney, was found to be impervious."[4] "Acute suppurative nephritis," says Dr. George Johnson, "is not a common disease, but it is a very serious and a very fatal one. In one case it supervened upon chronic disease of the kidney, in consequence of the intemperate use of fermented liquors, by a man whose general health was much disordered, and who had been subject, for several months, to successive crops of boils and carbuncles about the neck and shoulders. He died in about a week after symptoms of suppurative nephritis had manifested themselves. The nature of the disease was detected at the very commencement, by a microscopical examination of the urine. Both kidneys were much enlarged, evidently from a recent attack of acute inflammation; numerous small points of suppuration were scattered through them, and the left contained two large recent abscesses."[5]

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[1] Smith (Dr. Southwood), p. 306. [2] Op. cit. p. 298.

[3] Gendrin. Histoire Anat des Inflam. t. ii, p. 256, as quoted by Rayer, in op. cit.

[4] Watson (Thomas, M.D.), Practice of Physic, vol. ii, p. 538. London: 1843.

[5] Johnson (George, M.D.), Article Ren, Cyclop. of Anatomy and Physiology, vol. iv, p. 257. London: 1848.

Dr. Craigie mentions several cases of renal abscesses, occurring chiefly in strumous subjects.[1] Dr. W. T. Gairdner describes a case of a woman, æt. 27, who died with a peritonitis, sloughing abscess of the spleen, and purulent deposits in the kidney and lung. "The kidneys were of the natural size; one of them contained, in the cortical substance, numerous small abscesses from the size of a pin's head to that of a pea; several of these occurred in groups towards the surface of the kidney. The abscesses were not surrounded by any indurated substance, but by a vascular rim of a rose colour, and about half a line in diameter. They contained a bright yellow pus. A little pus was also, in one or two places, infiltrated into the tubular cones, near their base. The pelvis of the kidney was highly vascular, but contained no fluid."[2] It may be here observed, that the tubuli (as stated by Dr. W. T. Gairdner) are sometimes blocked up by a white opaque deposit, possessing none of the physical characters of pus. In one very interesting case of this kind, which he details at length, "the right kidney was broken up superiorly into several anfractuous cavities, from the size of a hazel nut to that of a walnut; these cavities were filled with a diffluent white substance, which had much of the appearance of softened brain. The cavities were lined by a false membrane which contained numerous gritty particles," and which appeared to be "composed of the condensed tissue of the gland." The microscope disclosed these white deposits to be "composed of molecules and granules, interspersed with free nuclei, the debris of the epithelium cells."[3]

Professor J. Y. Simpson mentions a case of cystous and granular disease of the kidney, which proved fatal from puerperal convulsions. "The right kidney was converted into numerous cysts, of about the size of a walnut, containing unhealthy pus, which passed along the ureter, and filled the bladder. The left kidney exhibited an advanced stage of Bright's disease." He mentions two other cases in which "purulent-like matter" was found in the kidneys of patients dying from puerperal convulsions.[4]

Without entering into any farther details, it may be stated, in qualification of the opinion of Dr. Carswell above quoted, that pus is occasionally, perhaps not very unfrequently, to be found in the kidney in fatal cases of small-pox, measles, typhoid fever, pneumonia, and other diseases distinct from inflammation extending to the kidneys from neighbouring organs, or succeeding to the operation of lithotomy, to injuries of the spine, to the presence of calculi, or diseases of the pelvic viscera. If this statement be correct,—and within certain limits it is incontrovertible,—how does it happen, that although the kidneys have been long and carefully studied in connexion with scarlet fever, that not one of the published necropsies of such cases, so far as I know, contain any record of pus being found in these organs?

It is beyond all doubt, that in a large number, if not in most cases of Scarlatina, there is—during the eruptive fever occasionally, but more

[1] Craigie (David, M.D.), Practice of Physic, vol. ii, p. 510. Edinburgh: 1840.

[2] Gairdner (Dr. Wm. T.), Pathology of Kidney, p. 29. Edinburgh: 1848.

[3] Op. cit., p. 15.

[4] Simpson (James Y., M.D.), Proceedings of the Obstetric Soc. of Edinburgh: in Monthly Journal of Med. Science, Sept. 1847, p. 212.

often during desquamation—bloody urine, scanty urine, or suppression of urine; and that in these cases the urine is albuminous, and the patients affected with dropsy, and often with alarming coma or convulsions. When such cases terminate abruptly in death, we commonly find simply hyperæmia of the kidneys, and a choking up of the tubes with epithelium; but if they prove fatal after a more prolonged period, that condition is found which is described as characteristic of advanced nephritis, and which has been so elaborately described by Rayer and other authors in connexion with Scarlatina and albuminous urine. That this affection of the kidney should be so common is not at all surprising, when we remember the frequency of acute desquamative nephritis in connexion with Scarlatina, and look through the microscope at the urine passed by the patients, and find it loaded with epithelium, and even with complete casts of the tubes, indicating the activity of the desquamation from the internal coat of the tubuli uriniferi. When this desquamation is excessive, it is easy to see how these small passages must become choked up with epithelium—and congestion, causing suppression ~~and~~ of urine, and ultimately dangerous inflammation—be induced: but it still remains to be explained how it is that such changes should so rarely terminate in suppuration.[1] Rayer, in the second volume of his *Traité des Maladies des Reins*, p. 428, discusses very fully the subject of albuminous nephritis succeeding Scarlatina, and gives most copious references to all the recent writers on the subject; yet in no part of his elaborate chapter does he mention pus having been found in the urine during life, or in the kidneys after death, in Scarlatinous renal disease; and in volume third, in his article on "Pyelitis," no reference is made to that disease occurring in conjunction with, or as a sequence to, Scarlatina. I have made pretty extensive inquiries among many friends well acquainted with pathological anatomy, and from all of them have received the same answer, that they had neither seen nor read of Scarlatinous renal nephritis terminating in abscess; nor has any one, except Dr. Bevill Peacock, informed me of having seen pus in the kidneys after Scarlatina. That gentleman, however, states that he has seen diffuse suppuration of the kidney. In a note with which he favoured me, of date 23rd of January, 1849, in reply to my inquiries, he says, "I do not know of any published cases of abscess of the kidney—true abscess, I mean—connected with Scarlatina. I have never seen anything of the kind, though I have found diffuse suppuration in such cases."

Case of H. L. D., aged 7 years and 10 months. The following is the history of the case referred to, which lately occurred in my practice. It will be observed, that the patient died on the fiftieth day from his seizure with Scarlatina; but that he was under my charge only during the latter thirteen days of that period. On one occasion, before I saw him, the urine had been entirely suppressed for seventy hours; and during the whole of my attendance it was of extremely low specific gravity, and

[1] Dr. George Johnson was the first to use the now generally adopted terms "chronic, and acute desquamative nephritis." Vide his admirable essay on Inflammatory Diseases of the Kidney, in the Med. Chir. Transactions, vol xxx, p. 165. London: 1847. He pointed out that "the desquamation from the inner surface of the tubes is analogous to that which occurs on the skin subsequent to the eruption of Scarlet Fever."

intensely albuminous—on some days, fully two thirds of its bulk being solidifiable by heat and nitric acid.

On the 24th December, 1848, I was requested to visit this patient, who, I was informed, had been under the care of able physicians. Every particular of the case was laid before me with great precision, on this and subsequent occasions, so that I am enabled to give a complete history of his illness. On the 24th December, when I first saw the boy, he may be considered as in the thirty-eighth day of the attack, reckoning from the first day on which he complained; at which time the throat was affected.

First Day. (17th Nov. 1848.) A slight sore throat was complained of.

Second Day. (18th Nov.) A slight appearance of Scarlatinous eruption was observed. He kept his bed: had two grains of calomel; and also saline draughts and powders every four hours, containing a little antimonial powder and nitrate of potash.

Third Day. (19th Nov.) The patient seemed to be convalescent: there was very slight sore throat; and no eruption was visible. No medicine was described.

Fourth Day. (20th Nov.) There was scarcely any sore throat or ailment of any kind.

Fifth Day. (21st Nov.) There was slightly increased sore throat; but not such as to cause any anxiety in the mind of the medical attendant.

Sixth Day. (22nd Nov.) He was decidedly worse this morning and continued very feverish during the whole day. The treatment followed on the 18th Nov. (*second day*) was resumed.

Seventh Day. (23rd Nov.) There was increased fever; and great drowsiness. Calomel, and the warm bath were ordered,

Eighth Day. (24th Nov.) Drowsiness ceased, and was succeeded by confusion of ideas and delirious talking. When roused, he always knew those around him; and answered questions rationally.

Tenth Day. (26th Nov.) The delirious condition continued during yesterday and to-day. The pulse was very rapid and faltering: the glands of the neck were now greatly swollen: the neck was rigid, and the head was thrown back. The medical opinion as to the possibility of recovery was on this day very guarded. Four leeches were applied to the swollen part on the left side of the throat, and calomel and antimony prescribed. The leeches bled freely.

Eleventh to Fourteenth Day. (27th to 30th Nov.) After the application of the leeches, the more urgent symptoms abated. On the night of the 26th, a considerable ichorous discharge commenced from the nostrils, and continued for a number of days. Between the 27th and 30th, the delirium gradually ceased; and the patient began to enjoy quiet rest. The swelling of the glands subsided; the pulse, however, continued high; and (with the exception of a slight moisture in the flexures of the joints, on the 28th or 29th,) the skin was hot, dry, and harsh (which it continued to be, with very little change, up to the last.) At this time, carbonate of ammonia was prescribed; and a certain quantity of beef tea was ordered to be administered to the patient, even though he should not indicate a desire for food.

Fifteenth Day. (1st Dec.) When seen by his medical attendant in the morning, his state was reported to the family to be improved; but,

in the afternoon, the nurse became alarmed by a return of the delirium. The alvine and renal secretions seemed to be almost suppressed, and pain with a sense of oppression were complained of at the scrobiculus cordis. Three grains of calomel, with three of antimonial powder were given.

Sixteenth Day. (2nd Dec.) The secretions were improved, and the delirium had subsided.

Seventeenth to Twenty-third Day inclusive. (3rd Dec. to the 9th Dec.) During this period, convalescence appeared to be proceeding; and, on the 5th Dec. he was said to be out of danger. During the whole of this period, however, symptoms, causing much anxiety, existed; *e.g.* dry, harsh skin, and a pulse never under 120. At this time, he had a bad state of throat, with ulcers, and difficulty in swallowing; but these annoyances gradually ceased. At this time also, he complained of some pain in the region of the stomach, he took the chicken broth, which was ordered, with loathing, and always insisted on having a basin ready, as he expected to be sick. The motions were never deficient in bile; and sometimes seemed to consist chiefly of that secretion. From the 3rd to the 6th December, the urine was of a dark colour, and moderate in quantity. When passed, it was clear; and, on standing, neither became cloudy, nor yielded any precipitate. About the 7th, 8th, or 9th (during which time he was taking acetate of quinia,) it underwent a decided change; it became much diminished in quantity, and, on standing, exhibited a thick light drab-coloured cloudiness. When tested with heat, no albumen was discovered.

Twenty-fourth Day. (10th Dec.) To-day the acetate of quinia was discontinued. The urine had been diminishing in quantity, and now the kidneys entirely ceased to act. There was not one drop of urine passed from the afternoon of Sunday the 10th, to the afternoon of Wednesday the 13th, being a period of seventy hours. During this period, the patient had a strong urinous smell.

Twenty-fifth Day. (11th Dec.) No change of symptoms or treatment.

Twenty-sixth Day. (12th Dec.) A mixture containing chlorate of potash was prescribed. The skin was still hot and dry, and the pulse continued, as formerly, at about 120. He was placed in a warm-bath, after which there was a decided perspiration, an occurrence which never took place during the course of his illness, except on this single occasion. A blister to the loins was talked of, and sweet spirits of nitre prescribed, as an addendum to the chlorate of potash mixture. Wine was also given.

Twenty-ninth Day. (15th Dec.) The sweet spirits of nitre were not persisted in, the wine was discontinued, and the kidneys acted better. Asses' milk was now given in small quantity, and beef-tea; but toast-and-water, of which he had abundance, was the only thing he liked. On this day, the state of the patient seemed more favourable; the pulse fell to 96; (but it never was so low again.) He had no tendency to vomit, or nausea after taking food, which he had had for several days previously.

Thirtieth day. (16th Dec.) Some wine was given during this day, after which the pulse rose to 120.

Thirty-first and *thirty-second days.* (17th and 18th Dec.) Stimulants were withdrawn during these two days, and the patient was ordered to have soda-water, with either asses'-milk, sherry, or lemon-juice, and to

be allowed to drink largely of cold water. Small doses of grey powder were given at intervals of eight hours. Two table-spoonfuls of blood were lost from the sores caused by the leech-bites. During these two days, the urine came in much larger quantities; and the general aspect of the patient seemed a shade better.

Thirty-third day. (19th Dec.) Drs. Willis, Gregory, and Paris held a consultation. There was some albumen in the urine, as there had been since the return of the secretion. The diet was directed by the physicians to consist of chicken-broth and white wine whey; and, as medicine, they ordered a preparation of cinchona.

Thirty-sixth day. (22nd Dec.) The last-named treatment was steadily pursued, up to the evening of this day: at first, there was an apparent improvement in the appetite. This evening, he began to retch, and brought up some unaltered blood, in small quantities. In the middle of the night, the patient vomited a good deal of black grumous blood. The pulse was 150, and not without power. In these circumstances four drops of Battley's sedative solution were administered; the bark and white wine whey were discontinued; and the soda-water and milk, which the patient always liked, were directed to be resumed.

Thirty-seventh day. (23rd Dec.) The females in immediate attendance upon the patient, thought him better; and the pulse had fallen to 120. During the day, he asked for some toast; and was supported in bed, and held the knife in one hand, and the toast in the other, cut off a piece of butter for himself, and though very weakly, contrived to spread it on the bread, and ate a small piece when prepared.

Thirty-eighth day. (24th Dec.) This was the day on which I first saw the patient. At this time, the family entertained little prospect of his recovery, and I saw nothing to justify my inspiring them with better hopes. I did not suggest any alteration in the treatment, as none seemed called for; and it was arranged that I should meet Dr. George Gregory in consultation on the following day, as he had already seen the patient several times.

Thirty-ninth day. (25th Dec.) The following treatment was agreed to by Dr. Gregory and myself. Three grains of grey powder to be taken immediately; and a teaspoonful of the following mixture three times a-day: ℞ Potass. nitrat. gr. xxiv, tinct. digitalis m. xxiv, sacchari ʒi, tinct. aurantii ʒi, aquæ, ad ʒiss. M. A warm fomentation of marsh-mallows to be used to the legs.

Fortieth day. (26th Dec.) 10 a.m. He had less tympanitis and œdema of the instep than yesterday; and there was less fever. Had three motions since taking the powder; the bowels had not previously acted since Friday, the 22nd. He complained of great thirst, and of much pain in the right arm; also of muscular and articular pains in the left arm. The urine was not deficient in quantity; specific gravity, 1012; highly albuminous.

6 P.M. Had passed four stools, with pain and tenesmus, since the morning. He was ordered to take half the following mixture directly, and the rest, if the bowels were moved, during the night. ℞ Tinct. card. co. m.xxx, opii m.iij, ol. anisi m.i, mist. cretæ ad ʒvj. M.

10 P.M. Both doses have been taken, and he has had two more stools. There was considerable increase in the tympanitic distension; but he was

more comfortable and freer from pain, than at six o'clock. In other respects, the symptoms are the same. ℞ Tinct. opii m. v, mist. cretæ ad ʒij, ol. anisi m.i. M. A teaspoonful after each stool.

Forty-first day. (27th Dec) Had a restless night, slept very little. The abdominal distension remained stationary, but the œdema of the instep and ankle were very considerably increased. The urine still continued as albuminous as formerly; and under the microscope exhibited in abundance globules like those of pus, casts of tubes, and crystals of uric acid. To discontinue all medicine.

Forty-second day. (28th Dec.) Much delirium at intervals; great increase of the abdominal distension, pushing up the diaphragm, and causing projection of the ribs. There was also, at times, stupor; but he answered questions occasionally. Since the morning of yesterday, he had had four small motions, of the colour and consistence of gruel. When I left him, at 4 a. m. of this day, the distension of the abdomen, the œdema of the feet, and delirium, seemed to be increasing rapidly from hour to hour; and all the indications were those of speedy death. On returning at

9 A.M., there was no increase of the distension or œdema, and a remission, if not a complete cessation, of the delirium. It is worthy of note, that before the delirium came on, he had been taking some white wine whey. Secretion of urine much diminished; the characters continue the same as formerly.

11 P.M. He was not worse; and had passed two or three small bilious and fæculent evacuations.

Forty-third day. (29th Dec.) 7 p. m. Since the last report, he had passed some small bilious and fæculent evacuations, and the quantity of urine was considerably augmented.

Forty-fourth day. (30th Dec.) The amount of distension of the abdomen, and of œdema of the legs, had greatly abated, and was not more than when Dr. Gregory saw him on the 25th. Had the yolks of two eggs. Shortly after taking the second, he had some nausea, with distressing efforts at vomiting, while I was present; and he took, with good effect, 30 drops of brandy mixed with about ʒiss of water. With this exception, he had had nothing which could be called medicinal, since the 27th. During this day he suffered greatly from muscular and articular pains in the upper and lower limbs, when they were moved.

Forty-fifth day. (31st Dec.) Urine increasing in quantity; specific gravity, 1011. A copious precipitate was produced by heat, which was sparingly soluble in nitric acid. Scarcely any tube-casts were seen; and the number of organic corpuscles were greatly diminished.

Forty-seventh day. (2nd January 1849.) He was visited to day by Dr. Gregory, in consultation. As compared with his state at the last report, there was an observable amendment; but the progress had been so extremely gradual and steady, that no appreciable change could be detected from visit to visit. Petechiæ were observed on the arms and legs. At 9 P.M. he had the following draught, in consequence of the stools being frequent and relaxed: ℞ Trisnitrat. bismuth. gr. iij, tinct. opii m. iv, aquæ ad ʒvj. M. This was the only medicine which he had had, since the chalk mixture on the 26th, excepting the brandy before mentioned. Before taking it, he had a refreshing sleep of three hours' duration. Urine of specific gravity 1012; deposited a copious dirty

white sediment, containing mucous-looking globules, and some granular matter; the latter was but slightly affected on the addition of hydrochloric acid, but some crystals of uric acid were formed. The quantity of albumen, as shewn by heat and nitric acid, appeared to be diminishing daily.

Forty-eighth day. (3rd Jan.) Has had a good deal of refreshing sleep. Pulse 134; it had not been so low since I first saw him, on the 24th Dec. The petechiæ had not increased in number. State of abdomen, natural; less œdema; countenance improved. Had passed three ounces of urine since nine last night. Specific gravity of urine, 1015; clearer than before, and very much less albuminous; contained fewer globules. No casts of tubes had been observed for two or three days.

Forty-ninth day. (4th Jan.) Had a good deal of delirium and stupor. Specific gravity of urine, 1011; almost devoid of albumen.

Fiftieth day. (5th Jan.) Died this evening, having been shortly before death conscious of what was going on around him, and swallowing nourishment up to the last. He sunk exhausted: the pulse becoming feeble and fluttering, and the respirations hurried.

Sectio Cadaveris, made thirty-seven hours after death, on the 7th January 1849, 9 A.M. to 1 P.M., by myself, assisted by Dr. Alexander Henry. The weather was frosty.

External Appearance. There was no cadaveric expression of the countenance, which was more like life than it had been for a day before death. The body was perfectly flaccid, apparently quite fresh, and exhaled scarcely any odour. It was very greatly emaciated. There was œdema of the hands (especially of the palms), and of the instep. On both arms, the petechiæ, which were noticed some days ago, were observed to be more marked, and likewise of a more florid aspect than during life. They were also sparsely scattered over the legs, but did not extend above the knees.

Head. On removing the calvarium, the arachnoid membrane was observed to be distended with serous fluid; and through the membrane, chiefly between the convolutions, were seen numerous white consistent flakes. The vessels at the base of the brain were not distended; there was a considerable quantity of fluid effused in this situation, external to the arachnoid. The substance of the encephalon was remarkably firm. On slicing the brain from above downwards, the white and grey matter appeared well marked; and the usual number of red spots were seen. On gently pressing the mass, drops of red fluid blood appeared immediately at each. The right lateral ventricle was very much distended, and contained several drachms of clear fluid, which, on being heated, and tested by nitric acid, was found to contain a good deal of albumen. The choroid plexus was bulky, and appeared œdematous, and was not distended with coloured blood. The foramen of Monro was sufficiently large to admit of a crow-quill. The left ventricle was also distended with fluid, and enlarged, but to a much less extent than the right.

Chest. On opening the chest, the lungs did not collapse. There were between eight and nine ounces of fluid in the pleural cavities; the right containing the larger proportion. The lungs, anteriorly, were pale, and had no appearance of emphysema, but were very œdematous. They crackled when pressed, emitting a frothy serum-like fluid at the

margins of the incisions which had been made in them. Posteriorly, the lungs had a purple appearance, most probably depending on gravitation during life, and on cadaveric congestion; they were here also very œdematous, especially at their margins. The *heart* contained a very small black clot in the right ventricle, and about two ounces of fluid blood in the right auricle. In both ventricles were shreds of dense fibrinous coagula. The substance of the heart was firm, but very pallid; it was entirely destitute of fat. The endocardial surface was perfectly smooth, and the valves quite healthy. The pericardium contained some ounces of serous fluid, the exact quantity of which was not determined. The aorta yielded fluid blood.

Abdomen. The stomach was intensely congested at the œsophageal end; and in this situation, there was a place where the mucous membrane was softened. The rest of the alimentary canal presented nothing remarkable. The *liver* was gorged with blood; but apparently quite natural in other respects. The *gall-bladder* contained bile, of the natural appearance and fluidity. The *pancreas* and *spleen* were firm, and apparently healthy. The *kidneys* adhered loosely to their capsules, and seemed atrophied. They had a mottled appearance, such as is represented in Fig. 1, of a plate accompanying Dr. Willis's interesting paper on the "Dropsy following Scarlet Fever," published in the *Edinburgh Monthly Journal* for 1841, p. 697. On bisecting the left kidney in the mesial line, it presented the well known appearance characteristic of "albuminous nephritis," *i. e.* the cortical substance was pale, anæmic, shrunken, and horny, and the pyramids (as contrasted with the surrounding tissue) looked red and turgid. This kidney contained a well-defined, circumscribed cavity at the lower part, which would admit of a large hazel nut; there was also a smaller cavity, of the size of a small pea, communicating with the other. Both cavities were chiefly filled by dirtyish-white matter, somewhat resembling cerebral matter in a state of softening. Along with this, in the passage between the cavities, and in the pelvis of the kidney at the point where it communicated with the larger cavity, there was some fluid pus—perhaps in all about a scruple by measure. That it really was pus could not be doubted, both from it appearance to the naked eye, and from the characteristic pus globules being well seen under the microscope. Upon examining the dirty-white matter, it was seen, along with some pus-globules, to contain much epithelial debris; and upon comparing it with Dr. Gairdner's case, already referred to at p. 453, we became quite satisfied that what he has so well described was what we saw. The right kidney, externally, had a somewhat nodulated aspect, being deeply indented at the sulci. When bisected, it presented almost exactly the same appearance as the left, excepting that there were no cavities and no pus.[1] The *bladder* was moderately distended with urine. Subjoined are the

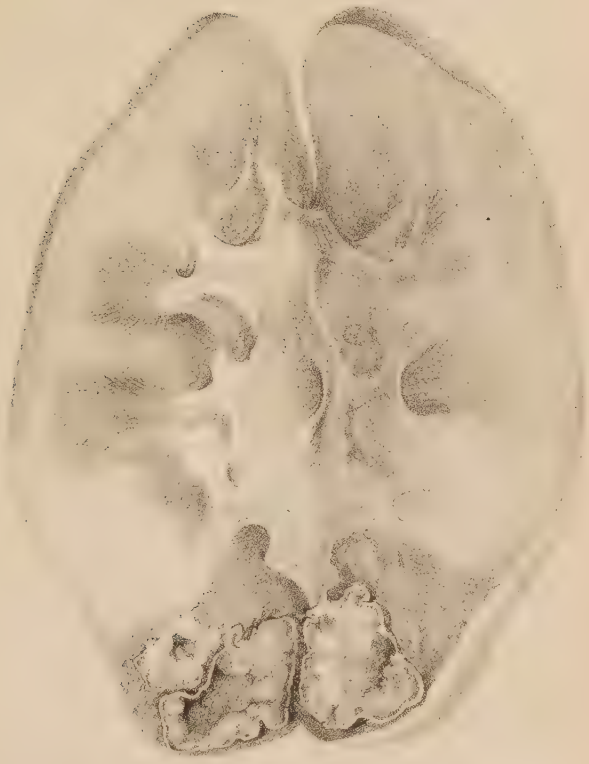
WEIGHTS OF THE DIFFERENT ORGANS.

Cerebrum	21oz 13drs.	Liver	12oz. 0drs
Cerebellum	2 : 8	Pancreas	0 : 10
Pons Varolii and Medulla Obl.	0 : 6	Spleen	1 : 2
Lungs	7 : 4	Left Kidney	1 : 10
Heart	2 : 8	Right ditto	1 : 4

[1] The preparation, and a coloured drawing of the left kidney, were exhibited by me at the Westminster Medical Society on the 14th April.

ABSCESS OF THE KIDNEY.

Following Scarlatina



On Wood by H. George

Described by Dr Corr

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George & Cº. Lithography, 24. Huston Gardens

Remarks on the Case. The case of H. L. D. possesses many points of interest. The whole train of symptoms, the coincidence of Scarlatina with albuminous urine and dropsy, as well as the appearances found on dissection, clearly indicate that the morbid changes were similar to those commonly described by authors under the term Scarlatinous Albuminous Nephritis. Convalescence seemed to be likely to commence at the end of the eruptive fever, when a new fever set in, in connexion with excessive desquamation from the internal surface of the tubuli uriniferi. The epithelium was formed and separated too rapidly, to admit of its being washed out by the urine; the tubes, therefore, became choked up, and the organ, probably already somewhat engorged with blood, was rendered still more so by this obstruction, and a state of extreme hyperæmia was the result. This was proclaimed by the urine becoming albuminous, and the secretion being suppressed from the 10th to the 13th December—a period of seventy hours. The skin and mucous membrane of the lungs acted for the kidneys to some extent, as was indicated by the urinous breath and odour exhaled by the patient; who at this crisis would certainly have died comatose, and probably convulsed, had not Nature found vicarious outlets for the urea, and other poisons circulating in the blood.

It is not necessary to suppose, that at this stage, any irremediable structural change had taken place, such as that found on dissection, viz., obliteration of the veins and tubuli; because we know, that mere *congestion of the kidney from any cause* may bring on albuminuria, or even suppression of urine, with the cerebral symptoms which are excited by non-elimination of urea and other excrementitious products from the blood. These phenomena may exist as the result of renal congestion caused by certain morbid poisons, as in congestive fevers and the cold stage of ague and cholera; or as the consequence of the irritation of renal cancer or calculus; or from mechanical obstruction to the free return of blood from the kidney, as in the albuminous urine, associated with cerebral disorders of various kinds and degrees, seen in some women from pressure of the gravid uterus; and in many patients suffering from ovarian, aneurismal, and other abdominal tumours. Any tumour pressing directly or indirectly on the emulgent vein must, I believe, certainly induce albuminuria; for the experiments on rabbits of Dr. G. Robinson show that the ligature of that vessel produces this effect.[1] These considerations are of extreme practical value, because they show the importance of daily examining the urine for albumen in the course of Scarlet fever, as well as during and after this and other diseases, in which cerebral seizures, and suppressed or diminished secretion of urine are to be dreaded; so that no time be lost, on the discovery of albumen, in endeavouring to relieve the kidney from its hyperemic condition, by alvine derivative treatment, hot fomentations, large bran poultices, or, when the symptoms are urgent, cupping over the loins.

But to return to the case under consideration. The cortical substance, so pallid and devoid of blood-vessels on dissection, was greatly altered by long-continued disease. Congestion had, long before death, passed into active inflammation. There had been inflammatory granu-

[1] Robinson (George, M.D.) On Granular Disease of the Kidney; and its mode of action in producing Albuminous Urine. London: 1842. Dr. Robinson argues ably, and, to my mind, conclusively, in favour of "granular degeneration" being "nephritis."

lar exudation into, and around, the tubes, excited by the pressure of the gorged veins; the veins also had became inflamed; and both had subsequently become atrophied, by the contraction of the cacoplastic lymph which had been effused. The albuminous condition of the urine, and other symptoms originally caused by mere congestion, were kept up by this state passing into inflammation, and thus rendering permanent that which was at first, as regarded the veins, mere obstruction from congestion with blood, and as regarded the tubuli, obstruction from pressure on their walls by the enlarged veins, and internal choking with epithelium. In granular disease of the kidney, that treatment which relieves renal congestion palliates the symptoms and diminishes the amount of albuminuria; and the sudden but brief amendment, with diminished albuminuria, which occurred in the case of my patient on the 30th December, must be ascribed to the bursting of the abscess having relieved the surrounding congestion, previously excited and kept up by its pressure.

It is to be regretted, that albuminous urine is still so much spoken of as specially diagnostic of renal *disease*, as it leads to errors in practice. The opinion of Dr. C. J. B. Williams is undoubtedly correct,—that, *per se*, albuminuria indicates nothing more than *congested* kidney.[1] The facts already stated establish the correctness of this view.

In the treatment of patients emerging from Scarlet Fever, and even of those in an advanced stage of convalescence, or apparently quite recovered, it is most important to remember, that, from remaining debility, or, more generally, from this cause in conjunction with obstruction of the tubes from excessive desquamation, slight chills are apt to cause hyperæmia of the kidneys, which, when neglected, may originate a formidable, and even fatal, train of symptoms. Diuretics are seldom safe in such cases: though sometimes spiritus ætheris nitrici may be given. Besides the remedial means already referred to, it is important to order as adjuvants, (or as prophylactics), the clothing of the entire body in flannel, the use of mild but nutritious diet, and the scrupulous avoidance of exposure to chills, to wet, or to currents of cold air,—not only until desquamation from the skin and tubuli uriniferi have ceased, but till the patient has regained his wonted tone. Scrofulous children recovering from Scarlatina, require special watching; for even when they have had the disease so mildly as to be scarcely perceived, they seldom escape without dropsy of more or less intensity. There is a great proneness to renal congestion in scrofulous children, even when little out of their usual degree of health; this is evidenced by the frequency of albuminuria in them. I have repeatedly found the urine albuminous in the febrile attacks of strumous children; and in a case of tabes mesenterica, with dropsy, which I lately cured (by steady mild purging, cod-liver oil, and syrup of the iodide of iron), the urine at the commencement of the treatment was intensely coagulable by heat and nitric acid. In the diseases of children of scrofulous taint, (especially when the skin is harsh and scaly), the urine ought always to be tested for albumen; and, in a large number of cases, it will be found to contain it, but will often cease to do so, on the exhibition of a smart purgative. Dangerous cerebral diseases may thus be very often averted.

Essex House, Putney, April 1849.

[1] Williams (Charles J. B.) Principles of Medicine, p. 193. London: 1848.

BIBLIOGRAPHICAL RECORD.

PARTURITION AND THE PRINCIPLES AND PRACTICE OF OBSTETRICS. By W. TYLER SMITH, M.D., Lond. Lecturer on Obstetrics in the Hunterian School of Medicine. pp. 395. London: 1849.

WE can imagine the pleasure with which WILLIAM HUNTER or DENMAN would have welcomed the present work; certainly the most valuable contribution to Obstetrics that has been made since their own day. For ourselves, we consider its appearance as the dawn of a new Era in this department of medicine.

The First Lecture treats of the peculiar stamp given to British Obstetric practice by the combined influence of race, religion, civilization, and social habits; it contains a comparative estimate of the relative values attached to the life of the mother and fœtus, during gestation and parturition, in this country and on the continent. The nobleness of the Obstetric art is eloquently vindicated throughout. DR. TYLER SMITH would banish the midwife from this department altogether, just as surgery banished the barber, and medicine dismissed the monk. The lecture contains some interesting observations on the different tendencies of Protestant and Roman Catholic practice in preferring the life of the mother or her offspring, and also a criticism of the plan of tearing away the placenta before delivery, in placenta previa; a practice which, it is maintained, sacrifices the child, and is an improper excess on the side of our national bias to prefer the life of the mother to that of the infant. We reserve our quotations for future lectures, otherwise there are many passages relating to these subjects which we should be glad to introduce to our readers.

In the Second Lecture, the three leading IDEAS of Obstetrics—Developments, Mechanism, and Motor Actions—are succinctly traced. It is shown that, up to the present time, our knowledge of parturition as a motor function, had advanced little beyond the description given by Fabricius, the teacher of Harvey, nearly two centuries ago. It is demonstrated that the works of Drs. Robert Lee, Ramsbotham, Rigby, and other contemporary writers, scarcely contain a hint of the real physiology of labour. Full justice is, however, accorded to those who had previously contributed facts towards the elucidation of this function, as one belonging to reflex physiology. After resuming the progress of our knowledge of parturition, the author concludes as follows:—

"Thus, then, with the exceptions just named, a few paragraphs by physiologists, a few pages by obstetricians,—and these latter chiefly occupied by the purely mechanical part of labour,—make up the sum of our knowledge of the physiology of parturition. How is this to be accounted for? It certainly is not that parturition is a less important function than digestion, or respiration, or even the circulation of the blood, all of which have been so amply investigated. The uterus has been compared, by a distinguished living physiologist, to the stomach, as being the organ of nutrition and support to the species. We may, with equal or even greater justice, say that the uterus is to the Race what the heart is to the Individual: it is the organ of circulation to the species. Ages are the channels in which created beings circulate; and man passes continually from the womb of his mother onwards to the womb of time. The succeeding generations of human kind, following one after another, are, as it were, the pulses of the animal Cosmos. Parturition is the systole of the uterus, the unimpregnated state its diastole, and the living beings which flow on in countless numbers in the stream of life, may be likened to the myriads of globules revealed by the microscope in the circulation of the blood. In relation to the vast scheme of existence, parturition

does but assume its just proportions, and assert its rights to the attention of the physiologist, as the greatest epoch in generation.

"We must go on to develop the dynamical Idea, the physiological mechanisms of labour, of which at present there exists, within the pale of obstetrics, nothing but the bare data or formulæ for their working out—namely, the muscular structure, and the nervous endowments of the uterine system. The generation is but just passed away which denied the muscular structure of the uterus; and the very existence of the nerves of the uterus some are still found to deny. However, granting that the nerves and muscular fibres have been beautifully delineated by the scalpel of the anatomist, it remains still to study these parts in action. They exist as a picture, but they have not been studied as actors or performers in a drama; and there is even more difference between anatomy (as we now understand the term) and physiology, than there is between painting or sculpture, and dramatic representation." (pp. 29-30.)

The Third Lecture is one of the most important, and gives a full account of the different forms of Motor Action concerned in parturition. The share taken by volition, by emotion, by reflex action, and by the peristaltic action of the uterus, is here traced distinctly, for the first time, throughout the whole of labour, including the contraction and dilatation of the uterus and vagina, and the actions of the muscles of respiration. The account is both analytic and synthetic, the single and combined actions of labour being described with great clearness. Much information is extracted from the consideration of cases, in which some, or nearly all, of the motor powers are subtracted, as in labour with insensibility, paraplegia, or delivery after death. Dr. Smith sums up his analysis as follows:—

"Volition may be said to affect the process only indirectly. Emotion has a direct influence, but it is accessory rather than essential to its performance. Reflex action is the great physiological power, which being absent, the function of parturition could not be properly performed. Peristaltic or Immediate action is the basic or radical element upon which the other causes of motor action operate." (p. 48.)

On this subject we quote a few of the instances, adduced by Dr. Smith, in order to prove the existence of reflex actions of the uterus:—

"The Reflex actions of the uterus are very numerous, and it is upon these, and the numerous extra-uterine reflex actions excited during the process, that the natural performance of parturition essentially depends. Contraction of the uterus, from irritation of the mammæ, as in the act of suckling the child; contraction of this organ from the cold water douche, applied to the vulva or the abdominal surface; contraction excited by irritating the rectum, as by stimulating enemata; or of the stomach, by drinking a gulp of cold water; of the ovaria, by the presence of the menstrual nisus; of the vagina, by manual irritation, as in 'taking a pain'; of the os uteri by irritation, as in the introduction of the hand into the uterus,—are all to be considered as so many instances of reflex spinal action. Thus, in parturition, the uterus may be excited, in a reflex form, by irritation of the mammary incident excitor nerves; the pubic and abdominal branches of the intercostals; the rectal; the gastric division of the pneumogastric; the ovarian nerves; and also by the nerves of the vagina, and the os and cervix uteri." (pp. 34-5.)

An excellent account is given of the dilatation of the os uteri in this lecture. It is contended that the os uteri dilates during labour partly as a muscular and dilatile structure, and partly as a non-muscular but distensile tissue. Its active or muscular dilatation is shown to belong to the reflex actions. We quote a passage which applies not only to the os uteri, but to all the orifices of the pelvic, abdominal, and thoracic organs:—

"For the performance of all the acts of ingestion and egestion, the thorax, abdominal cavity, and pelvis, may be looked on as forming one cylindrical

cavity, supplied with a number of stops, which close and open with admirable accuracy under the control of the nervi-motor apparatus, presiding over the various acts of ingestion and retention, egestion and exclusion. This is, in fact, one great function of the true spinal marrow, and its excitor and motor nerves. The materials for ingestion and egestion, by their physical qualities alone, independently of sensation, supply, when brought into contact with the ingestive and egestive tubes, the necessary stimulus to the excitor spinal nerves, whereupon all the necessary motor phenomena, both of contraction and dilatation, occur with the nicest regularity, and the most perfect aptitude for the functions to be performed." (p. 48.)

It has long been disputed whether the os uteri is really muscular or not. Dr. Smith disposes of these doubts in the most satisfactory manner, in a few words :—

"Owing to the mixed mechanical and muscular dilatation of the os uteri, it generally opens slowly; cases, however, occur in which, after long-continued rigidity, it dilates so suddenly, that even from this fact alone it is difficult to consider it a mere mechanical distention, the resiliency of the part affecting its subsequent contraction. But the strongest physiological proof of the existence of muscular power in the os and cervix uteri, is the forcible contraction which sometimes occurs after full dilatation—as, for instance, in cases of encysted placenta, in which the fingers can only be introduced with the greatest difficulty; and again, in inversio uteri, where the speedy and powerful contraction of the cervix is one of the elements of the accidents most opposed to the re-position of the organ." (p. 46.)

We have been struck with the observations on the direction in which the peristaltic action of the uterus spreads over this organ, which are well worthy of study. We conclude our notice of this lecture by a quotation respecting post-mortem delivery, a subject about which much diversity of opinion has existed :—

"The solution of these extraordinary phenomena, though it has not hitherto been given, does not seem very difficult. A slow reflex action of the uterus may possibly continue long after the rhythmic respiratory movements have ceased, as long, indeed, as the body retains its warmth. But we know that the heart, œsophagus, and intestines, may be excited to peristaltic action after death; violent peristaltic action is often a part of the act of dying; and I am of opinion, that in the human uterus, it is peristaltic action chiefly which expels the child when the mother has died during labour undelivered. There is, however, another source of post-mortem muscular contraction, which I believe has never been referred to in the case of the uterus—this is, the post-mortem muscular spasm. We know that in the case of an analogous organ—the heart, the rigor mortis occurs to such an extent as to empty the ventricles of blood, and even to simulate concentric hypertrophy. The extrication of gases by decomposition in the abdomen, the explanation usually adopted, is not sufficient to account for the expulsion of the fœtus after death." (pp. 39-40.)

The Fourth Lecture is devoted to the Motor Actions of the Fallopian tubes and the vagina, in menstruation, coitus, conception, and parturition. There are good reasons for believing that the Fallopian tubes embrace the ovaria by a muscular action, in menstruation, coitus, and parturition. Dr. Smith considers this embrace a reflex action excited by the irritation of the ovaria in menstruation and œstruation, and by the vagina in coitus. He declares it to be, at the same time, one of the most remarkable instances of reflex action, and of the proof of the independence of the reflex function as regards sensation and volition.

"In the whole range of reflex action, or, indeed, of physiology, there is nothing more extraordinary than the reflex action of the Fallopian tubes from ovarian excitation. There seems a positive instinct, a power of selection, in the exactitude with which their fimbriated extremities find out and

embrace the ovaries, but for which, extra-uterine fœtation, with its great dangers, would be very frequent. In this internal embrace, the most perfect adaptation occurs, in the total absence of sensation and volition. Many minds have felt a difficulty in receiving the doctrine of the independent and insentient action of the true spinal marrow, and its excitor and motor nerves, because of the extraordinary adaptation and appearance of design sometimes observed after decapitation or decerebration, being fain to consider such adaptation a proof of the presence of design and will, in the spinal marrow itself. Here, in the case of the Fallopian tubes, there can be no suspicion of volition, and yet the motions of these muscular tubes are so unerring in their power of embracing the ovaria, and of not seizing the intestines or the abdominal parietes, as quite to equal any of those actions which have been supposed to be emotional or voluntary in decapitated animals." (p. 55.)

But the most important point respecting the motor phenomena of these tubes, is their application to the elucidation of the motor physiology of labour. Dr. Smith insists that the Fallopian tubes and the uterus must be viewed as a whole, so that the motor actions of one part of the parturient canal may throw light on the motor actions of the rest. He compares the contraction of the Fallopian tubes, during menstruation, to the contraction of the fore-limbs of the frog during oviposition, and to the contraction of the uterus during labour, indicating that in these apparently remote phenomena, ovarian irritation is the single exciting cause. In this the author foreshadows his theory of the cause of labour, to which we shall presently have to direct the special attention of our readers.

The contractile and dilatile actions of the vagina, in the impregnated and unimpregnated states, are clearly described; but it is as an excitor of reflex action in other parts, rather than as the seat of motor action itself, that the vagina is remarkable. We quote the following description of the vagina as a parturient organ :—

"The chief outlets of the mucous cavities, except the vagina, are guarded at the orifices by sphincters. The constrictor vaginæ, at the entrance of this canal, represents the sphincters found in other situations. It is a thin, small muscle, not perfectly orbicular. A perfect sphincter in such a situation would indeed be out of place, owing to the immense dilatation required of the vagina in childbirth. An ordinary sphincter, if it existed, must far exceed the sphincter ani in size. When labour comes to be treated of, it will be seen how a sphincteric muscle in this situation is compensated for, and how well the actual arrangement contributes to the safe expulsion of the fœtus. The cellulo-fibrous sheath immediately surrounding the mucous membrane of the vagina is an extension of the fibrous tissue of the uterus itself. I have already said that the os uteri is formed, like the pylorus, by a reduplication of the mucous and contractile tunics, only this mode of formation is more exaggerated in the os uteri than in the gastric sphincter. In labour, the process of dilatation causes the almost entire obliteration of the os uteri, and the uterus and vagina become, as it were, one uninterrupted canal. The vagina, and particularly the upper portion, enlarges in size during the latter months of pregnancy. A real growth of the fibrous or muscular sheath, similar to the growth of the muscular tissue of the uterus, with which it is continuous, takes place, though in a less degree. We know that during the early months there is some contraction, but in the later months an enlargement, and even protrusion, of the vagina; and during labour, not only is the diameter increased, but the length of the vaginal canal becomes greater. This could hardly exist, without an actual increase of size." (p. 59.)

The Fifth Lecture contains an account of the anatomy of the Nerves of the Uterus. If Dr. Robert Lee's writings contain the descriptive anatomy of the uterine system, this lecture may be said to contain its physiological anatomy. After describing the relations of the pneumogastric, the phrenic, the intercostal, the lumbar, and the sacral nerves, with the ganglionic nerves in the chest, abdomen, and pelvis, Dr. Smith observes :—

"If we adopt the view, that the plexuses of the abdomen, like the external plexuses, are mechanical adaptations for mixing nervous fibres from different sources, and apply it to the uterine nerves, it becomes a possibility, and, I may say, a probability, that the uterine nerves are more variously derived than any other nerves of the body. They may be derived from different points of the great nervous tract between the origin of the pneumogastric nerve, in the medulla oblongata, and the origin of the sacral nerves, in the cauda equina. There is no actual impediment to the approach of nervous fibres to the uterus, from the medulla oblongata through the medium of the vagus; from the cervical portion of the spinal marrow by the phrenic; from the thoracic by the splanchnic nerves; and from the dorsal by the compound lumbar branches of the sympathetic, and from the sacral nerves, which latter come directly from the spinal chord." (p. 65.)

Dr. Lee has given the proofs, supplied by dissection, of the existence of a large supply of nerves to the uterine organs; and Dr. Smith adduces the physiological proofs of the uterine nervous supply, which are scarcely less convincing. The latter says:—

"No one doubts that the uterus is susceptible of pain; this is one proof of a nervous connexion between the uterus and the brain as the organ of sensation. No one doubts that an emotion of the mind may excite the uterus to powerful contractions; this is another proof of nervous connexion between the brain and the uterus. No one denies that, during pregnancy, the uterus affects synergetically the most distant organs, producing the changes in the mammæ and the gastric disturbances, which are so universal; these facts are explicable by the existence of nervous communications between the uterus on the one hand, and the stomach and mamma on the other. There is no other route than that afforded by the nervous system. No one denies, either, that, after parturition, the breast or the stomach may excite the uterus to action: these facts further prove a reciprocal influence *from* the stomach and breasts *to* the uterus. Such facts are, in their sphere, as convincing as though the eye could see a great concourse of nerves running between these organs. A physiological fact is worth quite as much as an anatomical fibre. These communications can only take place through the medium of nerves, and whether there be one channel or many; whether the chief place be given to the spinal fibrillæ of the sympathetic, or to the proper nerves of the spinal chord, the necessity for uterine nerves is equally inexorable. There *must* be nerves, and there must be nerves *sufficient* for the functions to be performed. Anatomical facts can never give the lie to the facts of physiology." (pp. 67-8.)

The following observations apply to another *questio vexata*, namely, the increase in the size of the nerves of the uterus; they afford a powerful support to the dissections and descriptions of Dr. Lee:—

"Those who maintain that the nerves of the uterus do not increase in size during gestation, must show, not only that there is no such increase in the gravid, as compared with the virgin uterus, but they are bound to show, that the nerves relatively diminish in breadth during pregnancy; for when we consider the extent and superficies of the fully-developed gravid organ, it must be evident to the meanest capacity, that if the nerves of the virgin uterus, remaining stationary as regards size, are merely stretched upon, drawn out, or unfolded, over and in, the enormously increassd gravid organ, they ought proportionately to appear as much *diminished* as the growing tissues of the uterus are *increased* in size. The length of the virgin uterus is two inches; of the gravid, at the end of gestation, twelve inches. The weight of the virgin uterus is one ounce; that of the fully-developed gravid organ, twenty-four ounces. The disproportion in size between the fœtus and the adult man is not nearly so great as the disproportion between the virgin and the parturient uterus. If we could conceive the nerves of the fœtus stretched out or unwound in the space of nine months, so as to accommodate the skeleton of the adult, we should have but an imperfect idea of

the mechanical marasmus of the uterine nerves at parturition, which we are called upon to believe, if the nerves do not actually grow during gestation." (p. 72.)

We shall not dwell at any length upon the Sixth Lecture, the subject of which is the Ovular Theory of Menstruation. An elaborate history of this theory is given, in which their respective shares are given to Cruikshank, Dr. John Power, Dr. Lee, Professor Baer, and those who have followed them, MM. Negrier, Gendrin, Raciborski, Bischoff, and other physiologists. But the great points brought prominently forward are, the homological relations which exist between menstruation in the human subject, œstruation in mammalia; oviposition in birds, amphibia, fishes, and insects; and parturition in the human subject and mammalia: and also the arrangement of these varied functions around the ovaria as the common sexual centres. These homologies bring us a step nearer to the cause of labour.

We might quote many admirable passages from the lecture on menstruation, but we limit ourselves to the following philosophical remarks:

"Gregory has beautifully said, 'Hæc Naturæ lex, hoc consilium; ut singuli pereant homines, gens humana floreat.' This is exemplified in the phenomena of menstruation, conception, and parturition. The identical processes which frequently lead to disease and death in the individual, are resorted to by Nature for the separation of the ovule and the ovum from the parent system, in the perpetuation of the species. In pathology, how often do we see death caused by the exudation of fibrin in the trachea, or by perforation of the intestine, or by sphacelus, from obliteration of the vessels of a part. In the transmission of the race, we see an increased action perforate the peritonæum, for the escape of the ovule; we see coagulable lymph thrown out in the Fallopian tubes and the uterus, to effect the adhesion, and for the support, of the ovum during utero-gestation; and lastly, on the conclusion of pregnancy and parturition, compression of the uterine vessels on the maternal side, and a diversion of the circulation on the side of the fœtus, cut off the supply of blood to the placenta, when it is forthwith expelled as dead matter. So nearly are death and life connected!" (p. 87.)

In the Seventh Lecture, the various motor disturbances of Pregnancy, vomiting, cough, tenesmus, strangury, and cramp, etc., are discussed. The reflex nature of gastric, rectal, and vesical disturbance is at once obvious, and suggests some valuable hints towards treatment. Dr. Smith offers a new explanation of the cause of the distressing cramps of pregnancy, which is well worthy of attention. He considers cramp a disorder of reflex origin, and not the result of pressure on the sacral nerves, as usually taught. His reasons for this view are, that cramp sometimes affects the upper extremities, where pressure is out of the question, and that it is most common in the recumbent position, when least pressure is excited. He also compares the cramps of pregnancy to the cramps of cholera, and the cramps which occur in paralysis, from intestinal irritation. These and various other considerations leave little doubt of the incorrectness of the current notions respecting this affection.

Another subject treated at considerable length in the present lecture is the nature of the abdominal movements of pregnancy. These movements have been almost universally and entirely attributed to the fœtus. Dr. Smith strongly combats this exclusive view, with a variety of facts and observations, of which the following are the most important:—1. The early period at which movements may be felt, namely, about the sixteenth week, when the limbs of the fœtus are extremely feeble, particularly the inferior extremities. 2. The great violence and volubility of the movements in some cases, in which it appears as though the head of the child moved about from one part of the abdomen to another. 3. The influence of the emotions of the mother over these movements, certain emotions increasing or diminishing them in a remarkable manner. 4. The presence of these movements in cases in which the fœtus has perished, or in cases of uterine tumour without pregnancy.

5. The indentations sometimes observed on the limbs of new-born children, and caused by the limbs lying for a long time in precisely the same situation. 6. The remarkable fact, that the abdominal movements have been observed in great force in cases of amyelencephalic fœtus, or entire deficiency of both brain and spinal marrow. Dr. Smith quotes a case most distinct of this kind from M. Lallemand, and since the publication of his lectures two cases in point have been furnished him by Mr. Hoadley Gabb, of Hastings, and M. Zavisiano of Corfu. In these cases the centres of muscular motion, cerebral and reflex, were absent. But we ought to add, that though Dr. Smith maintains that all the abdominal movements are not fœtal, he does not deny the presence of motion in the fœtus. He teaches that these movements in part belong to the uterus, in part to the contained ovum, and he endeavours to define the two classes of movements.

"If the abdominal movements in the latter months of pregnancy are very carefully observed, two tolerably distinct kinds of motion may be made out. The one is a movement traversing irregularly over the abdomen, and conveying the sense of hardness either in ridges or in eminences underneath the hand. These movements are often felt at several points of the uterus simultaneously, and are accompanied by pain. When the hardness is most apparent, the patient will say that the child kicks and hurts her. These movements will in some cases continue for hours together, particularly at night. When very violent, they give the idea of a blow or a succession of blows, if the hand be laid upon the abdomen. The other kind of movement is distinct from that I have been describing; it conveys to the hand a sudden shock or impulse, like that obtained by repercussion in ascites, only stronger. The abdomen gives, as it were, a sudden shudder; it is like the quick and temporary movement of a young infant touched in its sleep. The first and most frequent of these movements I believe to be purely uterine; the second, fœtal, and to be felt only in undoubted pregnancy." (p. 96.)

Another important subject, referred to in this part of the work, is the cause of the ovoid position, and consequently of the presentation of the fœtus. We should premise that much difference of opinion prevails respecting "tone"; by Dr. Marshall Hall it has been considered to depend on the *direct* influence of the spinal marrow, but Dr. Smith has treated of it as depending upon a *reflex* spinal action.

"The state of the fœtus in utero is peculiar: as regards the absence of volition, it resembles deep sleep or cerebral paralysis, and it is comparable, in some degree, to the state of hybernation in animals, in which a low degree of respiration and oxygenation of the blood is kept up. In all these states, the muscles, which are subject to voluntary regulation, contract from the principle which has been called muscular tone; the sphincters are all closed, and the flexor muscles, as the stronger, acquire a mastery over the extensors, so as to contract the limbs. The muscles of the fœtus are, I have no doubt, subject to this form of contraction, its final cause being to keep the fœtus in an ovoid shape, adapted to its retention within the uterus, and to its expulsion through the parturient passages at the time of birth. The hidden Phidias of the womb not only moulds each fibre and particle in the inward laboratory, but arranges the limbs according to the fashion best suited to their preservation during the embryo state, and their delivery at the appointed time of labour. The flexion of the limbs of the fœtus in utero is not merely a passive, but an active state; for even after birth, volition is a long time in acquiring the power of extending the limbs with precision." (p. 100.)

We now come to the Eighth Lecture, perhaps the most original of the entire series, in which the Cause of Labour is, for the first time, investigated satisfactorily. It will be interesting to give the author's preliminary observations, which set forth the circumstances under which this important investigation was commenced:—

"In 1842, while studying the more obvious reflex actions of parturition,

the cause of the first contraction of the uterus met me as a barrier beyond which it seemed impossible to pass. The pious exclamation of Avicenna, 'At the appointed time, labour comes on by the command of God,' expresses his idea of the profoundness of the mystery, and his hopelessness of its solution. The words of the Arabian physician agree with the candid admission of a modern writer, Dr. Carpenter, that 'we know nothing' of the reason why the period of parturition should be just forty weeks after conception. And, though hypotheses have been numberless, no intermediate author has given anything like a reasonable solution of the mystery in which this subject has always been involved. I began by steadily considering the first motor phenomenon of labour—namely, the equable contraction of the uterus which occurs before the actual pains of labour commence; endeavouring to understand the nature of this contraction, and why the uterus should acquire the special tendency to contract at this time in preference to any other." (pp. 106-7.)

At first Dr. Smith supposed the muscular irritability of the uterus, excited by the mature fœtus, to be concerned in the first contractions; but it is obvious that such an explanation would not account for the action of the uterus observed in ventral pregnancies at the end of the term of gestation. As all the other acts of egestion in the economy are spinal and reflex in their nature, Dr. Smith was induced to seek for some special excitor of the uterus of a spinal kind. A variety of facts led him to the ovarium and the ovarian nerves, and an examination of the nature and results of ovarian excitement in the different classes of animals, established the periodic excitement of the ovarian nerves as the true cause not only of human parturition, but of every other variety of parturient action. It is first shewn, that in the lower animals,—in oviparous fishes, for instance,—coitus and oviposition are one act, ovarian excitement being the essential part of the process. As we ascend in the scale, the sexual organs become developed and divided, and the sexual function also becomes more complex. This physiological development is traced upwards from the most simple ovarian excitement, through the various forms of ovi-expulsion up to the human female, in whom coitus, menstruation, conception, and parturition, are all separate acts. Still, notwithstanding this division, ovarian excitement is the fundamental condition under which they all occur, by which, in fact, they are produced. In these various acts, a number of motor actions occur. In menstruation, there is the grasp of the Fallopian tubes; in conception, the ingestion of the ovum into the uterus; and in parturition, the expulsion of the ovum from the uterus. In all these instances, it is ovarian excitement which produces, in a reflex manner, the first contractions of the uterus and Fallopian tubes. We must, according to our author, consider the highly organized ovarium of mammalia, the Fallopian tubes, the uterus, and the vagina, as forming one sexual organ, the analogue or ulterior development of the simple laminar ovarium of the fish, which exists and performs its functions without any accessories. The ovarium is the essential part in both cases, and in the complex organs of the mammalia, the different parts are connected or tied together by the medium of the reflex function. The reflex nervous arcs, between the different portions of the parturient canal, are, as it were, bridges, connecting them together, and giving them UNITY. Dr. Smith points out that oviposition and coitus go on together, or succeed each other almost immediately, in insects, fishes, amphibia, and birds. In the silkworm-moth, oviposition succeeds immediately to coitus. An interesting comparison is made between the cocoon of the silkworm, the nest of the bird, and the uterus of mammalia. The nest is an external uterus, prepared by the parents; the cocoon is an external uterus, prepared by the offspring itself. In the salmon, coitus consists merely of external pressure, during which ova escape, and are fecundated by the male. In the frog, oviposition and coitus proceed at the same time. In birds, —the common hen, for instance,—the sexual embrace is permitted imme-

diately after oviposition. These results of ovarian excitement admit of comparison with the sexual phenomena of the females of mammalia. Œstruation and menstruation, without impregnation, are comparable with the unimpregnated oviposition of birds, insects, and amphibia. Œstruation and menstruation, with impregnation,—in fact, conception,—are comparable to the impregnated oviposition of the other classes of animals. As a specimen of the mode in which Dr. Smith unites ovarian and parturient action, we quote some of his observations on the generative phenomena of mammalia:—

"In many of the lower mammalia we may witness the processes of oviposition or œstruation, parturition, congress, and conception, all going on as nearly as possible at the same time. In the guinea-pig, for instance, immediately that the young are dropped, the female admits the male, conception takes place, and a new utero-gestation commences, dating from the very hour of parturition. There is, in these animals, œstruation and ovulation going on in the ovaria while parturition is taking place from the uterus; and during or immediately after the expulsion of the young, the sexual heat developes itself. The same phenomena are present in all the mammalia, in a greater or less degree. In those animals of which we know the order of the œstrual periods, as the rabbit, the horse, and cow, the duration of pregnancy is a multiple of an œstrual period. Doubtless this law is as extensive as periodic œstruation itself. Not only is gestation a multiple of the œstrual period, but the time of parturition is positively an œstrual period. The maturation of ova, which has ceased during utero-gestation, is resumed, and the sexual instinct is predominant, just as though the uterus did not contain the product of a former ovulation and conception." (pp. 114-15.)

In the same way, Dr. Smith accepts the doctrine that the duration of human gestation is a multiple of the catamenial period. But he goes on to consider parturition as really a menstrual period, and he compares the lochial to the catamenial flow; he teaches that in parturition the developed *ovum* moves on from the uterus to the external world, just as in menstruation the unimpregnated *ovule* moved on from the ovarium to the uterus. This view is supported by a comprehensive array of facts, and from the whole series of observations, Dr. Smith makes the simple yet great induction, "that ovarian excitement is THE LAW OF PARTURITION IN ALL ITS FORMS OF OVI-EXPULSION."

We conclude our notice of this interesting lecture by quoting the author's account of the mode in which ovarian excitement produces the commencement of the series of acts which constitute human parturition. We should observe that Dr. Smith points to the *corpus luteum* as the portion of the ovarium specially involved in the excitement of parturition.

"When the ovarium is anatomically severed from the rest of the sexual apparatus, as in the mammalia and the human female, the ovarium is connected with the rest of the parturient canal by a series of reflex arcs. By means of the spinal excitor nerves of the ovaria, that portion of the spinal centre which presides over the actions of the uterus is, at the end of utero-gestation, thrown into a state of excitability or polarity, somewhat resembling the general spinal excitability of tetanus. The uterine nervi-motor system being thus thrown into such a state of persistent excitability, that the uterus firmly contracts equably upon its contents, the fœtus itself, hitherto defended by the liquor amnii, becomes an ordinary excitor, and the reflex actions of labour are gradually established. The equable contraction of the uterus, preceding labour, is, in effect, just as though the membranes had been punctured, as in the operation for inducing premature delivery, and the head of the fœtus brought to exert pressure upon the os and cervix uteri." (p. 123.)

Such is the solution of one of Nature's greatest mysteries.

The next two Lectures, the Ninth and Tenth, are occupied with the causes and prevention of Abortion; but as we purpose, in a future number, to review the practical portion of Dr. Smith's work in a separate notice, we shall now pass these two lectures, and proceed to the Twelfth and Thirteenth, which treat

of the Physiology of Labour, and the causes of the Sexual Periodicities in the human female. These two lectures complete the strictly physiological portions of the volume before us.

In the Eleventh Lecture we come to the actual Physiology of Parturition. And here we pause to make a few observations on the arrangement of the different stages of this function proposed by Dr. Tyler Smith. Up to the present time, accoucheurs have, almost implicitly, followed the division of Denman. Of the three stages of this celebrated accoucheur, the first extends from the commencement of labour to the full dilatation of the os uteri and the discharge of the liquor amnii; the second begins at the full dilatation of the os uteri, and ends with the expulsion of the fœtus; while the third includes all that relates to the separation and expulsion of the placentes. Dr. Smith proposes a modification of this division, founded on certain physiological considerations. He would divide this function into five stages, as follows :—

I. The Preliminary Stage, in which the preparations for actual labour are made.

II. The stage of Dilatation, in which the os uteri is dilated for the passage of the presenting part of the fœtus.

III. The stage of Propulsion, in which the fœtus is propelled through the os uteri and the vagina.

IV. The stage of Expulsion, in which the fœtus is expelled through the external parts.

V. The Supplemental stage, in which the placenta is expelled, and the uterus returned to a state of permanent contraction, and at length, of rest.

Thus it will be seen, from Dr. Smith's arrangement, that actual labour itself, consists of three physiological stages, namely, Dilatation, Propulsion, and Exclusion; the Preliminary and Supplemental stages are but accessory to these.

In the *Preliminary* stage there is little or no pain, the uterus descends somewhat, a permanent contraction of the organ takes place, rendering it more distinctly firm and ovoid than before, and the abdomen becomes quiet, from the cessation of the peristaltic actions of the uterus. There is an irritable state of the rectum and bladder, leading to the frequent evacuation of the contents of these viscera. The effect of this irritability of the bladder and rectum is to free the pelvis and lower part of the abdomen from all unnecessary incumbrance, and so to give room to the parturient canal.

In this stage of labour, *the ovarian nerves* are the only excitors which are in action. The ovarian nerves, acting in the manner already indicated, produce the utero-spinal excitement upon which the contraction of the uterus depends. The ovarian excitement is the *first* in the order of events, the *spinal excitability* and the action of the uterine motor nerves follow. The equable uterine contraction, produced by the ovarian excitation, impels the presentation against the os uteri, and the mechanical excitation of the nerves of the os uteri, thus occasioned, gradually induces the actions of the next stage.

In the stage of Dilatation, sensation, secretion, and motor action are all involved; these are distinct pains, the flow of blood and mucus, and the proper motor actions of the uterus. The uterine contraction becomes intermittent instead of continuous. Each pain is attended by contractile efforts of the fundus and body of the uterus, and by dilatation of the os uteri. Dr. Smith discusses the nature of this dilatation very fully, proving it to be an active dilatation of a reflex kind. When the body of the uterus contracts, the tendency of the os uteri is to dilate. This dilatation of the os uteri, in parturition, is compared to the dilatation of the cardia when the œsophagus contracts in swallowing; to the dilatation of the sphincter ani when the rectum contracts; or to the dilatation of the sphincter vesicæ, which attends contraction of the distended bladder. The only difference is one of time, and the os uteri dilates slowly, because of its peculiar anatomical character,

to which we have already referred. Hitherto this subject has been very ill understood, though it is of great practical import. Attention is next called to the direction in which the motor force of the uterus is exerted, in this stage of labour. It is exerted downwards and backwards, in the direction of the triple axis of the child, the uterus, and the inlet of the pelvis. This is exactly the direction in which the fœtus is required to advance during this stage. Up to this point, the lower medulla only has been engaged in the reflex motor actions; but when the dilatation is complete, sickness or vomiting often occurs, and these prove that the medulla oblongata is now involved in the process. The dilatation of the cardia in sickness or vomiting reacts favourably on the os uteri and vagina; and if vomiting take place, it is beneficial, by giving room, and increasing the freedom of the respiratory actions of the succeeding stage of labour. The next point referred to, is the rigor which is generally observed at the conclusion of this stage, of which an excellent reflex explanation is given. Some highly original observations are made upon the evacuation of the liquor amnii, which now takes place. The preservation of the membranes entire, up to this period, is important, not only because it ensures fluid instead of solid pressure in the dilatation of the os uteri, but because the fluid pressure stimulates the excitor nerves less powerfully than the solid pressure of the subsequent stages. On the other hand, the rupture of the membranes, and the evacuation of the liquor amnii, at this point, not only provides more powerful mechanical excitation for the next stage, but, by diminishing the bulk of the uterus, gives greater facility for the action of the abdominal muscles. The perfect adaptation of even the slightest events in natural parturition, in this and a thousand other instances, is indeed most admirable.

In this stage of labour, *the ovarian nerves* are acting as excitors, as before, and *the nerves of the os and cervix uteri* come into play as additional excitors of the reflex actions. The only motor nerves involved, up to the point at which nausea or vomiting occurs, are *the motor nerves of the uterus*, and the uterus is the only muscle in action. The head, or presenting part, of the child, and the amniotic bag, are the mechanical excitors of the uterine nerves.

In the stage of Propulsion, the uterine contractions are much more powerful than in the previous stages, and strong expiratory efforts accompany each pain. The more powerful efforts of the uterus depend on the circumstance, that the fœtus is now brought into direct contact with the internal surface of the organ, in consequence of the discharge of the amniotic fluid. The expiratory efforts are excited, from the irritation of the vaginal excitor-nerves, by the advancing head of the fœtus. Dr. Smith minutely analyzes the various muscular actions which are now in operation; but for this we can only refer to the work itself. We quote, however, a few words which illustrate the beautiful manner in which volition and emotion tend to prevent laceration in the powerful pains of this stage:—

"When the pain can no longer be borne, the short gasp or groan is exchanged for a cry which dilates the glottis, and the pain and contractions subside. The cry is a motor action, excited by the emotion of pain, and instantly relieves the uterus of all extra-uterine pressure. Thus the glottis may be compared to a safety-valve, which is thrown open by emotion whenever the pressure becomes more than can be borne with safety. By the influence of volition we have this valve entirely under our control, to open or to close it, as may be necessary. When the expiratory actions are weak, we can enjoin the patient to hold her breath, and when they are too intense, or too long-continued, we can encourage her to cry out, which is of course equivalent to dilating the glottis, and expiring the contents of the thorax." (Pp. 162-163.)

In this stage, the motor force of parturition is applied in quite a new direction. The direction in which the fœtus has now to pass, is that of the axis of the outlet of the pelvis, or downwards and forwards. This direction is

given by the contractions of the abdominal muscles, which urge the fundus uteri against the vertebral column. It is remarkable also, that the long axis of the head, the advancing part, corresponds very closely with this new parturient and axis.

The excitor spinal nerves acting in this stage, are *the ovarian, the uterine, and the vaginal nerves.* These are now in relation both with the medulla oblongata, as the centre of the respiratory arcs, and with the medulla spinalis inferior, as the centre of the utero-spinal excitor and motor nerves. The motor nerves which are excited to action, are *the uterine nerves*, and the whole class of *respiratory motor nerves.*

In the Stage of Expulsion, the actions of the previous stage are continued, but a new series of actions come into operation as the head of the child passes the ostium vaginæ. We quote a description of these actions, which it would be difficult to condense :—

"The perinæum, after being distended to the utmost, is now retracted over the head by the action of the levatores ani; the sphincter ani and sphincter vesicæ dilate suddenly, the vagina contracts upon the advancing mass, and the head glides rapidly into the world. The dilatation of the two sphincters, between which the vagina is placed, compensates admirably for the absence of a perfect sphincteric muscle at the outlet of the parturient canal. The effect of this double dilatation is, that at the precise moment when there is the most imminent danger of laceration, there is a sudden and considerable removal of tension from the parts endangered. The dilatation of the sphincters is partly dependent on the sensation and emotion of severe pain, and partly on the reflex dilatation peculiar to the sphincteric muscles. This view of the subject gives interest and importance to an action which has never been looked upon but as a very disagreeable *contretemps.* Physiology here, as in many other instances, transmutes the meanest actions of the economy, rendering them noble by virtue of their uses! At the same moment that the orifices of the rectum and bladder are thrown widely open, there is generally a dilatation of the glottis. Even from women who restrain the expression of their emotions during the rest of labour, a cry of pain escapes at this juncture; this cry is necessarily accompanied by an open state of the glottis. The opening of the glottis is not at all accidental or voluntary, but is as regular and involuntary as its closure during the propulsive pains. Its effect is suddenly to take away the expiratory pressure from the expulsive action. Without this combined action of the glottis, and the sphincters of the rectum and bladder, for the defence of the ostium vaginæ, recto-vaginal laceration must be a very common accident of parturition. Such would inevitably be the frequent result of closure of the abdominal and thoracic cavities at all points, except that at the point of exit for the fœtus, in the final throes of labour." (Pp. 163-164.)

The excitor nerves involved in this stage, are *the ovarian, uterine, and vaginal nerves, and the nerves of the ostium vaginæ;* the upper and lower medulla are implicated; and the motor nerves in action include the *uterine, vaginal, and respiratory nerves*, and *the nerves of the rectal and vesical sphincters.*

In the Supplemental Stage the objects to be attained are, the expulsion of the placenta, and the contraction of the uterus so as to avert hæmorrhage. The uterus contracts intensely, from the great irritation supplied by the fœtus in passing the perinæum; it is afterwards excited by the placenta; on the separation of the placenta, the wound-like surface from which it has been detached becomes strongly excitor. But new excitors are brought into play at this juncture; the breasts excite the uterus powerfully whenever the child is applied, and every thing taken into the stomach produces uterine contraction. The uterine contraction is also aided by the maternal emotions.

The excitor nerves involved in this stage are *the ovarian, uterine, vaginal, mammary, and gastric nerves;* the motor actions are chiefly confined to the

uterus, and chief motors are the *uterine nerves*. We quote, as an addendum to our sketch of Dr. Smith's account of Parturition, his own summing up of the several parturient motor actions; than which nothing can be more graphic, or, we believe, more correct:—

"We can now review the order of the nervi-motor actions of labour, the series of excitor surfaces involved one after the other, and the regular succession of stimulus and contraction in the different stages of the process. First in the order of events, there is the excitation of the ovarian nerves, followed by the equable and continuous contractions of the uterus. Then there is the pressure exerted by the fœtal head, as yet defended by the liquor amnii, upon the os uteri, and the consequent excitement of the orificial nerves, with the answering and intermittent contractions of the uterus. In the next place, the vaginal excitor nerves are irritated by the pressure of the now advancing and undefended head, or presenting part of the fœtus, an irritation which calls forth the respiratory actions of labour in addition to the uterine contractions. Then we have the excitation of the nerves of the ostium vaginæ, and the remarkable modifications of motor action thus produced. After the expulsion of the fœtus, the placenta remains to supply an intra-uterine stimulus, sufficient to affect the now exalted excitability of the uterine nerves, and thus to cause its expulsion. When the placenta has been expelled, the excitation of the uterine surface, from which the placenta has been separated, the excitation of the mammary nerves by suckling, and by the secretion of milk, and the excitation of the pneumogastric, now in excito-motor relation with the uterus every time food or drink are taken, are, with the aid of emotion, and the continuing ovarian irritation which has been present during the whole of labour, perfectly sufficient in normal cases to prevent hæmorrhage, and gradually to effect the return of the uterus to the contracted and comparatively small size of the unimpregnated woman who has borne children." (Pp. 167-168.)

The whole account of labour is in the highest degree original. We do not know of any work in which any one of the many important points we have reproduced in our hurried abstract, has been treated satisfactorily by previous writers. We are at a loss which to admire most, the simple clearness with which point after point is evolved from obscurity, or the grandeur and beauty of the whole physiological problem.

The close of this lecture contains, we believe, the first published idea of the division of the reflex arcs of the spinal marrow into a vertebral, or zonal, arrangement,—a topic which has subsequently been touched upon by Dr. Gull in the Gulstonian Lectures of the present year. Dr. Smith observes: "As the vertebræ of the vertebrata are analogues of the rings of invertebrate animals, there should also belong to each vertebra the representative of a spinal centre. Are not the reflex arcs collected together in the medulla oblongata, the spinal centres of the cranial vertebræ? and are not the reflex arcs of the lower medulla the spinal centres to the pelvic rudimentary vertebræ? This view brings the reflex motor arcs of the spinal centre into harmony with the splendid ideas of Oken, Goethe, and their distinguished successors in archetypal anatomy." (P. 74.)

In the Twelfth Lecture, Dr. Smith attempts the explanation of the CAUSE OF THE SEXUAL PERIODICITIES in the human female,—a point of inquiry hitherto considered unapproachable. The first thing he essays to do, is to array all the important facts relating to the synergic or reciprocal actions of the three great organs of the sexual system—ovaria, mammæ, and uterus—into six groups, as follow: 1, the actions of the ovaria upon the mammæ, as in the tumidity and pain in the breasts from ovarian irritation; 2, the actions of the ovaria upon the uterus, as in the secretion of the catamenia from ovarian excitement; 3, the actions of the mammæ upon the uterus, as in the production of abortion by irritation of the mammæ; 4, the actions of the mammæ upon the ovaria, as in the arrest of ovulation by lactation; 5, the actions of

the uterus upon the ovaria, as in inflammation of the ovaria from uterine irritation; 6, the actions of the uterus in the mammæ, as in the secretion of milk excited by uterine irritation. Under each head we have merely given one instance of synergic or sympathetic action; but a variety of instances are given by Dr. Smith, from which we have, for the sake of brevity, selected the above. Dr. Smith further believes that physiological actions are constantly going on between all these organs, in the directions indicated: He says,

"There is a remarkable synergic balance preserved between the three great organs of the sexual system,—namely, the Uterus, Mammæ, and Ovaria. In the virgin state, the condition of the ovaria at each ovarian periodic excitement, excites the uterus to secrete the catamenial flow. When impregnation has occurred, the changes set up in the uterus during the development of this organ and its contents, react on the ovaria, and interfere with the ovarian periodicities, so that they become masked during the whole term of pregnancy. At the time of parturition, the ovaria and uterus are the seat of a special excitement, and it is this excitement of the uterus and ovaria which excites the mammæ to the secretion of milk for the supply of the new-born infant. After delivery, the uterus soon returns to a state of comparative repose; but during lactation, the actions going on in the mammæ, like those of the pregnant uterus in ordinary cases, prevent the full development of the ovarian periods. As soon, however, as lactation and the mammary development have ceased, the uterus, breasts, and ovaria, all resume their ordinary periodicity, and ovulation and the catamenial flow proceed regularly until a fresh impregnation occurs. Thus the catamenial cycle of twenty-eight days is departed from at conception for another cycle,—namely, that of gestation, which consists of 280 days, or ten lesser cycles. After the completion of gestation, a new cycle is commenced,—that of lactation,—upon the completion of which the system returns to the simple catamenial cycle. These cyclical and epicyclical periods are themselves all included in another great period of development, extending from puberty to the decline of the catamenia." (p. 179.)

Dr. Smith bases his explanations on these facts. First, taking the catamenia. He believes, that during the four or five days of the catamenial flow the ovaria and mammæ, but chiefly the ovaria, are acting intensely upon the uterus, exciting the uterine secretion, but that on the completion of the discharge, the uterus and mammæ react upon the ovaria, but in a moderate degree, preparing the ovaria for the next ovulation. In other words, during four days, the ovaria and mammæ are directing the uterus; during other twenty-four days the uterus and mammæ are influencing the ovaria. According to this view, the twenty-four days during which the ovule is being matured in the ovaria, is as much a periodicity as the four days of the uterine discharge, and the catamenial period of twenty-eight days is simply a record of the time occupied in one action and reaction of the sexual organs upon each other in the unimpregnated female.

During utero-gestation, Dr. Smith teaches that neural actions are going on between the three sexual organs, which do not at this time result in ovulation and menstruation, but in the development of the gravid uterus, the preparation of the breasts for lactation, and the maturation of the corpus luteum. These reciprocal actions go on during the space of ten catamenial cycles, at the end of which time, ovarian excitement is set up, which, in turn reacts upon the uterus, and excites the first uterine contractions of labour. In lactation, Dr. Smith believes that the various actions are directed chiefly to the mammæ; the actions towards the uterus and ovaria being at their minimum, so that during ordinary lactation, neither ovulation nor menstruation proceed.

"In the unimpregnated state, when the catamenia are regular, the mutual actions and reactions between the uterus, breasts, and ovaria, proceed regularly, preserving each organ in its physiological condition. At this time the Ovaria are as it were the centre of the sexual system. The sum of the actions

is to keep up the periodic maturation and dehiscence of ovules from the ovaria. To this the actions of the breasts and uterus all tend. When impregnation has occurred, the mutual actions still go on between the three organs; but the Uterus has now become the sexual centre, the actions of the breasts and ovaria all tending to promote the development of the uterus. During utero-gestation the ovaria and mammæ remain comparatively quiescent. This state of things continues for ten sexual periods, until the phenomena of parturition occur. Another change now supervenes; the reciprocal actions continue under a fresh aspect, and the mammæ now become the centre of the sexual organs, every action becoming subservient to the maintenance of the mammary glands in the secreting condition." (p. 184.)

"We can observe how the development of the ovaria at puberty sets the catamenial cycle in motion, consisting of the actions of the ovaria, uterus, and mammæ. The first ovarian excitement, which probably appears in the usual course of growth or development, is, by the actions and reactions it excites between these three organs, the cause of all the phenomena, not only of the first catamenial cycle, but of all the purely catamenial periodicities which occur in the unimpregnated state, from puberty to the decline of the catamenial function. Again, we may perceive how, upon the act of impregnation, another stimulus comes into operation, which, in its turn, sets the cycles of gestation and lactation in motion. The ovario-uterine excitement produced by the impregnated ovule supplies the momentum, which, acting and reacting between the reproductive organs, is the cause of the periodic phenomena of gestation and lactation, including the cause of labour and the first secretion of milk in the mammæ. Upon the conclusion of the cycles of gestation and lactation, the stimulus imparted at conception having exhausted itself, the organs of reproduction again fall back upon the catamenial periodicity.

"These actions are, as it appears to me, dissimilar to reflex actions, and they may be referred to a general Law of action and reaction in the animal economy. They are themselves the result of a triple synergy, united and tied together, as it were, by the spinal centre, and involving neural actions to and from the nervous centre, and between the organs themselves, in no less than twelve different directions, which, balancing and controlling each other, regulate the functions of the three organs in their alternating states of rest and activity. The whole would seem to be an arrangement for giving as much simplicity and harmony to the sexual system, in the state of segregation in which it exists in the higher animals, as is found in those lower animals in which the reproductive faculty is confined to one organ—namely, the ovarium. By this tri-synergic and tri-cyclical arrangement, the triplicate system of the human female approaches towards Unity. The uterus and ovarium are joined together, and the most distant organ, the mamma, becomes a strictly accessory structure to the ovario-uterine canal. Another result of this arrangement is, that in the higher animals the sexual system, instead of being dependent on the seasons or on other external circumstances, is self-regulated, and brought into the reproductive condition at frequent and regular intervals." (pp. 186-7.)

We have thus given a brief, but we believe accurate and succinct, outline of the original views contained in this volume. At every page of the work itself, practical deductions are drawn from the physiological doctrines as they are advanced; but we have for the present chiefly confined ourselves to the latter. In a future bibliographical sketch, we shall, with equal care, go over those lectures, which are entirely devoted to practical points; and we are sure that the interest of our readers will not flag while they follow us in our task. We would observe, that we do not pledge ourselves to all and every doctrine promulgated by Dr. Tyler Smith. This would be impossible, considering the magnitude of the subject itself, and the great variety and importance of the topics discussed; but we do most cordially

recommend the work as one absolutely necessary to be studied by every accoucheur. It will, we may add, prove equally interesting and instructive to the student, the general practitioner, and pure obstetrician. It was a bold undertaking to reclaim Parturition for Reflex Physiology; and it has been well performed.

(To be continued.)

Elements of Electro-Biology, or the Voltaic Mechanism of Man, of Electro-pathology, especially of the Nervous System, and of Electro-therapeutics. By Alfred Smee, F.R.S. 8vo. Plates. London: 1848.

A work on science, the advent of which is heralded by newspaper paragraphs, is naturally regarded with some suspicion by literary men; and the metropolitan, as well as provincial press, but a short time since, announced that Alfred Smee, Esq., F.R.S., was about to publish a book, containing discoveries so novel and so important, that he would at once take rank among the most distinguished of discoverers and philosophers.

The work *has* appeared, and the public expectations will be sadly disappointed; for what does it show? Why, that Mr. Smee is a man of one idea—that he is haunted with a phantom which must sit heavy on his soul! Whether he eat, or sleep, or see, or hear, or feel, or think, he does so through the medium of voltaic currents. According to him, man (who has been called the "prime work of God") is neither more nor less than an animated voltaic battery, and every function is explicable accordingly. Physiologists have expressed their inability to explain some of the more refined phenomena of life; and to many, the phenomena of sight and hearing have been attended with difficulties; but, *hey, presto!* all these vanish before the wand of the great magician, Mr. Alfred Smee.

What are the requisites for the maintenance of organic life? Mr. Smee replies, "a central apparatus supplied with a peculiar fluid, a peripheral apparatus similarly supplied, the whole connected together to form one universal total (!) is the apparatus desired, and such an apparatus we have in a double voltaic battery." (p. 5.) Vision is equally satisfactorily accounted for. "The essential structure of the eye consists in a definite number of distinct poles of the electro-biological batteries; and according as they are influenced by illuminated images, an action would occur in a sort of pattern, *similar to that used by ladies for the designs of worsted work.* At this point, light loses its physical characters, and becomes aisthenic by its determining a voltaic circuit, which acts upon the brain and gives a knowledge of the external world." (p. 18.)

This is simple enough, but the simplicity of Mr. Smee increases as he proceeds. What is memory?—apparently an act very independent of man. "If we take two iron wires and place them in a solution of argento-cyanide of potassium, and direct a voltaic current through them, silver would be reduced at that wire constituting the negative pole. The two wires would be ever afterwards in different electric relations to each other; one would be positive, the other negative; *and thus the effects of memory would be shown, and future actions regulated.*" (p. 31.)!!

We confess that such a startling result is not *quite* clear to our minds; but these quotations show the strange conclusions arrived at by the author, and, in our judgment, the language is not only singularly incorrect, but the reasoning is very bad, and most of the deductions are crude, unphilosophical, and unsupported by facts.

Among other marvels which this book contains, is the result of an experiment performed by Mr. Smee on his celebrated Aphis vastator. "During last summer, I subjected the Aphis vastator to the action of electricity of tension for a long period, and one brood was kept negatively electrified, the other positively; but after some period, when they produced young, I found

on one pole the vastator, at the opposite the bean aphis." (p. 76.) Mr. Smee has a "faint suspicion" that the character of the kinds was modified by the electricity; that the aphides must have had but an uncomfortable time of it in the electricity of tension is likely enough, but we must decline to agree with the author that the characters of the species were altered thereby. Although we do not profess to be better than our neighbours, we have an objection to a fashion very prevalent at the present day, of disseminating doctrines nearly allied to materialism. It was said of the great Lord Thurlow, that when about to make an assertion greatly at variance with truth, he was more than usually profuse in his oaths as to its correctness. In like manner, many writers of the sceptical order make a great parade of their desire to avoid anything like materialism; and thus winning the good opinion of their readers, they instil the poison with more deadly effect. After considering whether a totally different organic being may spring from another organic body made up of cells, and quoting the experiments of Messrs. Cross and Weekes (without stating that they have been shown to be fallacious), Mr. Smee says: "There is amongst those endowed with little minds, an unwise, an unjust, and a false prejudice against those who undertake such investigations. It is assumed that such men are infidels and atheists, and possess every other bad quality to which hard terms have been assigned. Such parents bring up their children to despise investigation; and the finger of scorn is pointed at all who dare consider the subject. On this account, this matter of vital importance has not received the labour and talent it merits. It has already been proved by Schwann and Schleiden, that a cell is the basis of all organic bodies; and, if hereafter it shall be discerned that, from modifications in the inherent power of the cell, different organic bodies result, what a sublime view would it present to the human mind! and the fact might justly be held by some future Paley, yet unborn, as the most powerful proof deducible from nature of the infinite power and wisdom of God." (p. 77.) This is all very fine, but we must dissent from the position laid down by Mr. Smee. It is not because people "undertake" the investigations in question that they are regarded as infidels and atheists; but because they jump to conclusions without sufficient proof. It is no small matter to assert that man can create a new creature—that it is permitted him to breathe the breath of life into the smallest atom that exists upon this earth. *Life* is equally the attribute derived directly from the God of Nature, whether it animate a crawling mite, a lordly elephant, or man himself; and if we admit that it can be called into existence by human means in the one case, we see no reason why it may not be called into action on the other. The structure of their bodies is equally marvellous: they differ only in magnitude and diversity of parts.

With these remarks we take our leave of Mr. Smee, regretting that we cannot speak more favourably of a work which, doubtless, cost the author much labour.

Cyclopædia of Anatomy and Physiology. Parts xxxi, xxxii, xxxiii. Edited by Robert Todd, M.D., F.R.S. May, August, and September, 1848.

We congratulate the subscribers to this useful work on the progress it is now making towards completion. '*Festina lentè*' was for some time the motto; but the publication of three parts in twelve months is an earnest of better arrangements. The contents of the three parts extend from "Products (Adventitious)" to "Secretion." Three articles are especially deserving of attention—Quadrumana, Ren, and Respiration.

Quadrumana. Those interested in comparative anatomy will find in this communication a valuable monograph. The results of the recent investigations into the osteology of the orangs are detailed; and nothing has been omitted which could render the article complete.

Ren is from the pen of Dr. George Johnson, and is a careful and elaborate digest of all that is at present known upon the subject of the Kidney, whether as regards its structure or morbid changes. Before proceeding further, we may mention, that in no department of anatomy or pathology, has greater light been thrown by the microscope than on the minute structure of the renal organs; to Mr. W. Bowman are we indebted for the removal of many errors, and the addition of much truly valuable information on these points. The article before us is divided into three parts; the first contains a concise account of the general form and structure of the renal organs in the lower animals. In the second, the anatomy and physiology of the human Kidney is considered, and the third part is devoted to its pathology. The manner in which the anatomy and physiology have been treated of by the author is felicitous, he having compressed into a moderate space the cream of the knowledge that is at present possessed on the subject; to those who have not followed the rapid progress of microscopical science during the last ten years, much of this section will be new. Not less instructive is the succinct account of the pathology of the Kidney; which is discussed, first, as a result of local causes, as retention of urine, irritation from a calculus, or a blow on the loins; and, secondly, as resulting from constitutional causes acting on the Kidney, by inducing an abnormal condition of the blood. The article is one of the ablest that has yet appeared in the Cyclopædia.

Respiration. Everything proceeding from the pen of Professor John Reid is deserving of consideration; and from the ability with which the subjects of former contributions have been treated, we commenced the perusal of the article before us with high expectations. These have not been disappointed. It is a most lucid, careful, and complete *résumé* of everything at present known respecting Respiration. The arrangement is excellent, the subject being treated of under distinct heads, so that the practitioner who has little time to devote to reading, but is anxious to acquire information on a particular point, can refer to it at once, without the necessity of wading through the entire article; from which, however, the grey practitioner as well as the youthful student cannot fail to derive most valuable knowledge.

The subject is judiciously commenced by a consideration of the amount of carbonic acid in the air under various circumstances, and an exposition of the beautiful harmony which exists between the vegetable and animal kingdoms, each supplying to the other that which is needed to support the breath of life, and removing that which, if permitted to accumulate, would be deleterious. The comparative anatomy (if the expression may be used) of Respiration follows, and is an appropriate introduction to the anatomy, physiology, and chemistry of that function in man. The observations of Mr. Hutchinson and Dr. Sibson on the statistics and mechanism of Respiration are carefully analyzed, the circumstances influencing, directly and indirectly, that function explained, and the article concludes with an admirable account of the phenomena attending the oxygenation of the blood, the atmospheric effects resulting, and the changes produced in that fluid by the process.

In this communication Dr. Reid sets a wholesome example to those who are fond of putting forward crude theories of their own, under the mantle of originality, rather than of benefiting their readers by submitting to them the well-digested labours of observers of acknowledged care and reputation. The present is too much the age for novelties, and that which is substantially good is too often put aside in favour of theories which, like bubbles, float in the air for a brief time, and then vanish for ever. Dr. Reid has, with infinite pains, brought together the result of the investigations of the best physiologists, past and present, has reasoned soundly upon them, and produced an article at once gracefully written, and affording the best information on the subject of which it professes to treat.

On Infantile Laryngismus: with Observations on Artificial Feeding, as a frequent cause of this Complaint, and of other Convulsive Diseases of Infants. By James Reid, M.D. Pp. 204. London: 1849.

Since the publication of Dr. James Simpson's inaugural thesis, *De Asthmate Infantili Spasmodico*, in 1761, and of the *Observations on the Asthma and Hooping Cough* of Dr. John Millar, in 1769, great attention has been paid to the subject of Infantile Laryngismus, and various treatises and papers of considerable merit have from time to time appeared, exhibiting the views of their respective authors on the nature and causes of this interesting, yet for some time obscure, affection. In the work of Dr. Reid, now before us, we find, in the course of a clear and instructive account of the History, Symptoms, Causes, Diagnosis, Prognosis, Post-mortem Appearances, and Treatment of Laryngismus Stridulus, an examination, *seriatim*, of most of the principal views which have been maintained, with such remarks on them as have been dictated by the author's experience.

The pages devoted to the History and Symptoms of the Disease appear to us worthy of a careful perusal, although our space does not permit us to give an analysis of them. In speaking of the Causes, he first notices, under the head of "Cerebral Causes," the opinions of Dr. John Clarke and Mr. Pretty, and observes that—

"If careful observation be made, I think it will not be found, in all cases, complicated with cerebral convulsions. Firstly, That there are not present the usual symptoms of congestion of the brain. Secondly, That in the great majority of cases, no unusual pathological appearances in the brain are met with, after a fatal termination from spasm of the glottis. Thirdly, That the remedies most successful in this complaint are not those which are usually employed in cerebral congestion; whilst, on the contrary, those which are there indicated, have frequently been productive of great injury in the treatment of Laryngismus." (p. 39.) Hydrocephalus has been considered, by Dr. Cheyne and others, to be a cause of Laryngismus; but Dr. Reid is "more disposed to agree with Gölis, and those writers who think that Laryngismus, especially when complicated with cerebral convulsions, may act as a *predisposing cause* of hydrocephalus; and thinks it may be fairly inferred, that hydrocephalus, though sometimes a complication, is very rarely a cause of Laryngismus. Neither does he consider there are any strong reasons for believing that an Inflammatory Condition of the Brain, or of its membranes, gives rise to the complaint. The idea of Dr. Hugh Ley, that Laryngismus is essentially a paralysis of the muscles which open the glottis, arising from pressure on the pneumogastric nerve by the pressure of enlarged cervical and bronchial glands, he considers to be disproved both by positive and negative evidence, and thinks that similar arguments will apply to the Enlargement or Diseases of the Thymus Gland, which have been alleged as a cause by Mr. Hood, Drs. Kopp and Hirsch, and others. The conclusions at which the author has arrived, as to the etiology of Infantile Laryngismus, are as follows:

"1. That for the occurrence of this complaint, the cerebro-spinal system is required to be in a peculiarly excitable state, which thus acts as a *predisposing* cause. The period of 'teething' is the most likely one to produce this affection." (This period he considers to commence with the birth of the infant, and not to be limited to the time when the teeth are escaping from the gums; although the liability to the complaint is then increased.)

"2. That during this irritable state of the nervous centres, the two most frequent (and, in the majority of cases, the combined) causes, are '*the improper description of food*' which is administered to the infant, and '*the impure and irritating atmosphere which it breathes.*" (p. 71.) Under the head of "Improper Description of Food," Dr. Reid includes not only artificial diet, but also the *human milk* itself, which, in many cases, from the peculiar constitutional condition of the mother, or wet nurse, is rendered unfit for the

nourishment of the infant. He directs special attention, however, to the influence exercised by "rearing by hand," in causing mortality among children. From the reports of several institutions, he proves that an artificial diet is a most prolific cause of death among infants. A report of the Dublin Foundling Hospital, drawn up in 1797, states that, "during the preceding six years, 12,786 infants were admitted, out of whom 12,651 died, 135 only surviving." Further, "in the Dublin Lying-in Hospital, where the infants *are suckled*, the mortality, during the first fifteen days, is only one in 58½; in the Hospice des Enfans Trouvés, at Paris, where the children are fed by hand for the first nine days, the mortality during that period is one in four.—*Brit. and For. Med. Review*, April 1839." (p. 83.)

The DIAGNOSIS of Laryngismus from Croup, Hydrocephalus, and Hooping Cough, is well pointed out by the author; and the PROGNOSIS is considered to be in every case somewhat uncertain. The POST-MORTEM APPEARANCES he thinks calculated to afford us very little aid in detecting the proximate cause of the complaint, and suggests a more careful examination of the state of the mucous membrane of the intestines.

The TREATMENT which Dr. Reid recommends during the paroxysm is similar to that employed in the asphyxia of newly-born infants, in order to excite the respiratory function. Abstraction of blood is warrantable only in exceptional cases; and emetics are advisable only when the affection supervenes on over-repletion of the stomach. Dr. Reid places considerable reliance on the use of purgatives, combined with mercurials, and with alkalies. The indication is not to produce any severe cathartic effect, but "merely to unload the intestines of the constipated masses generally contained in them, to regulate the secretions, and to remove undue acidity and flatulence." (p. 121.) Antispasmodics are of considerable service in subduing the tendency to the spasmodic paroxysm; and a stimulating embrocation, containing also some narcotic ingredient, applied to the spine, chest, or abdomen, will be followed with benefit in many cases, especially when the limbs are affected by spasmodic contractions. To remove the lingering effects of Laryngismus, tonics are frequently found of great influence, especially the preparations of quinine and iron.

The observations on the DIET of Infants who are predisposed to convulsive affections, commence with some judicious remarks on *Suckling*, on the importance of which too great stress cannot be laid. This practice should be followed in every case, where some disqualifying cause, such as hysterical paroxysms, strong passions, or non-secretion of milk, are liable to produce injurious results. In cases where a wet nurse is required, such an individual should be selected with care, attention being paid to her constitution, diet, and general habits. Dr. Reid recommends that weaning should take place gradually; and, in cases where exclusive feeding by hand is unavoidable, the infant should be fed by *suction*, that being the method by which a child receives its natural aliment. When artificial nourishment is to be given to a child, the author knows of none better "than that composed of two parts of cow's milk" (not boiled) "with one of thin barley-water, or grit gruel, slightly sweetened." (p. 146.)

Attention to the diet of children liable to convulsive diseases must be strict and unremitting. "As a general rule, breast-milk should form their only nutriment, if possible, for the first nine or ten months; and the artificial food which is, after this, given in addition, should be of a consistence not much thicker than the milk itself. Light broths, carefully prepared, may gradually form a portion of the diet table; but solid animal food should not be given before the child has attained its eighteenth month, if the molar teeth have then made their appearance; but in many cases it will be advisable to defer its use till the child is two years old. It certainly must be considered a great error to give animal food to a young infant, before its grinding teeth are ready to masticate properly." (pp. 149-50.)

Change of air has been of great benefit in some instances. In all cases every effort should be made, especially in large towns, to procure as free and pure an atmosphere as possible, attention also being paid to the temperature, which should be equable, varying from 60° to 63°. Out-of-door exercises, in fine weather, is generally beneficial, by allaying irritability.

The last forty-six pages of the book consist of an appendix of twenty-six cases of Infantile Laryngismus, which occurred in Dr. Reid's practice, or the notes of which were furnished to him.

There are one or two points which, perhaps, as critics we ought not to omit to mention. In the first place, although Dr. Reid refers to the era of dentition as pre-eminently the era of Laryngismus, we do not think he has dwelt sufficiently upon the irritation of dentition as the exciting cause of the laryngeal spasm. Dr. Reid partially recognizes the reflex nature of Laryngismus; and dwells especially upon the pneumogastric nerve as the special excitor. Now, we believe the trifacial nerve to be even more important as an excitor of Laryngismus, than the pneumo-gastric or any other nerve whatever. Another point has struck us, namely, that no reference is made to the really splendid essay on Laryngismus, by Dr. Marshall Hall, read before the Medical Society of London, May 17 1847, and subsequently published in the Lancet,—an essay which contains the best account we have met with of the reflex pathology of this disease.

In concluding our notice of this work, we would cordially recommend it to our readers as an excellent treatise on Laryngismus. Dr. Reid has evidently paid much attention to the subject, both by carefully observing the cases which have fallen under his care, and by making himself acquainted with the opinions of others. The results at which he has arrived are embodied in a form which, although there does not appear to be any striking originality in his views, is well calculated to serve as a faithful guide to all who are concerned in the treatment of Infantile Laryngismus.

Practical Remarks on Near Sight, Aged Sight, and Impaired Vision; with Observations on the Use of Glasses, and on Artificial Light. By William White Cooper, Fellow of the Royal College of Surgeons of England, and Senior Surgeon to the North London Ophthalmic Institution. pp. 216. London: 1847.

Mr. White Cooper's *Practical Remarks* are intended to serve as a guide to a subject with which medical men are expected to be well acquainted, and which is also interesting to the general reader. It is almost surprising that, considering the importance and interest which are attached to an organ in such constant use, and at the same time requiring so great an amount of *hygienic treatment* as the eye, there should be a scarcity of works on the subject in the English language, in the form which Mr. Cooper has adopted.

The work is divided into six Chapters, and an Appendix. The first chapter treats of Sight, and the Anatomy and Physiology of the Eye, and is written in a plain style, without any pretensions to elaborate minuteness, but calculated to impart to the general reader a correct knowledge of the subject.

Chapter II treats of Myopia, or Near Sight. The author draws a distinction between myopia arising from imperfection in the form, consistence, or relation of some of the refracting media; and myopia arising from the loss of adjusting power. This distinction between structural and functional myopia is important in a practical point of view, inasmuch as the treatment varies in the two cases. In structural myopia the defect is remedied by concave glasses,—double concaves being better than single. Mr. Cooper very judiciously observes, "It is not only of the highest consequence that near-sighted persons should avoid increasing the power of their spectacles needlessly, but they should carefully avoid wearing them constantly; for, with proper care of the eyes, such as the avoidance of much close application, of reading by the light

of a hot fire, or studying by too brilliant a light, glasses of a low power will answer every useful purpose for a long series of years." (p. 56.) The second form of myopia arises from over-exercise of the eye in pursuits requiring close application, and consists in the loss of the power of adjustment to the focus for distant objects. This affection is very prevalent among students at universities, and especially among the Germans, who are great readers. In such cases "spectacles are absolutely injurious; they afford, it is true, the means of discerning distant objects, but they tend to confirm the disorder, and render the individual dependent upon artificial aid for the remainder of his life. The course which ought to be pursued is plain: the patient should abstain from study, and all pursuits requiring close application, and he should endeavour, by due and well-regulated exercise of the eyes, in the country if possible, to recover that adjusting power of which, by injudicious exertion, he has deprived them." (p. 74.)

Chapter III treats of Presbyopia, or Aged Sight. This is one of the earliest indications of advancing age; and its causes may be:—

"1. A flattening of the cornea from a diminution in the bulk, either of the aqueous or vitreous humours, or of both, the result of defective secretion.

"2. An alteration in the consistence, and diminution in the convexity, of the crystalline lens.

"3. Diminished density of the various humours.

"4. Diminished curvature of the retina, which, existing while the vertical diameter of the globe remains about the same, prevents the refracted rays that enter the flattened cornea from forming a picture upon the retina." (p. 77.)

Presbyopia is to be distinguished from *hard lenticular cataract* by the improvement in vision in the latter affection, on dilatation of the pupil, and by the cataract being capable generally of being seen as a greenish, greyish, or amber-coloured haze, of various opacity, in the centre of the pupil; and from *amaurosis*, by the evidence of disturbance of function of the retina,—though the ordinary premonitory symptoms of muscæ volitantes, double vision, headache, &c., may be absent,—and by the sluggish action of the pupil of the affected eye when the other is closed. Presbyopia may also be a congenital or temporary condition, or may succeed or precede myopia, of all which Mr. Cooper relates instances. The remarks on treatment contain some important cautions. It is an erroneous idea to suppose that "preservers" can prevent further changes in the eye, if used in time. By the application of the term "preservers" to glasses of the lowest power, many are induced to use them before they are required, which is highly injurious, by inducing or hastening an indolent state of the eye. The decay of vision depends much on a person's habits as well as constitution. It is hastened by over-exercise of the eyes, especially by candle-light. Indistinct writing and small print should be particularly avoided by those, whose circumstances compel them to study in the evening. Reading by fire-light, or simply gazing at the fire when sitting alone is more or less injurious, and should be avoided; and long exposure to the reflection of a strong light is also hurtful. To preserve weak eyes as much as possible from a strong light, Mr. Cooper thinks neutral tint spectacles exceedingly suitable. He remarks that, in reading and writing, the light should be sufficient, and at the same time grateful and pleasant to the eyes; and this is best obtained by placing the candle or lamp behind the reader, a little to one side. Sudden transitions from gloom to strong light should be avoided. The author concludes the present chapter with impressing on the presbyopic reader the necessity of exercising the utmost precaution in the use of spectacles, and of employing the lowest power that can be of service, and then only when indispensably necessary. The same glasses should not be used by candle-light as by daylight.

Chapter IV contains some useful cautions on the subject of Glasses. A single eye-glass is highly injurious, as it causes an alteration in the relative strength of the eyes. Those whose occupation compels them to use a magni-

fier, should wear it alternately on each eye; and those who indulge in microscopical or astronomical pursuits, should learn to use either eye indifferently. In recommending glasses, great care is necessary to determine that the patient really requires them, and that such aid is proper; for, in some cases, as in myopia from loss of adjusting power, the use of spectacles would be improper. Recovery from near sight is more frequent among the lower classes, evidently because they seldom use spectacles, but overcome or arrest the defect by exertion of the eye.

On the subject of choosing spectacles, Mr. Cooper gives some useful information. The glasses should be free from specks or veins, and the figure of the lenses accurate; and the lowest power which can aid the sight should be chosen. There is also another point which is too often neglected; viz., the fitting of the spectacle frame, in such a way, that the centre of each glass shall be exactly opposite the pupil of the corresponding eye. The best material for their manufacture is blue steel, which combines the advantages of lightness, elasticity, durability, and neatness of wear. The use of spectacles should be dispensed with for as long as possible after the operation for cataract; and some cases have been recorded of the adjusting power of the eye having been so far restored, as to render them unnecessary.

Chapter V is on Artificial Light, and commences with a description of the effects which it produces on the eye, when in excess. The uncomfortable feelings about the eye often experienced by those who have been exposed to the heat and glare of a brilliantly lighted and crowded room, are not unfrequently followed by *Chronic Ophthalmia*. Muscæ volitantes—and, if these be neglected—amaurosis, frequently affect literary men; and also tailors, sempstresses, shoemakers, jewellers, and watchmakers. Some illustrative cases, with remarks on the treatment of these affections, now follow; for which we must refer our readers to the work itself.

Chapter VI is devoted to the consideration of the physical action, and the different kinds of Artificial Light. Light is injurious to the eyes, in proportion as the red rays prevail, which produce excitement, followed by debility, of the retina. Other causes of distress are the divergence of the rays, the unsteadiness of the light, or the evolution of carbonic acid gas and aqueous vapour, which tend to impair health. Mr. Cooper next notices the different kinds of artificial light now generally employed; viz., coal-gas, camphine, naphthalized coal-gas (Smee), oil, etc. He prefers wax candles for those who employ their eyes much by night. To remedy the injurious effects of artificial light, arising from its having an excess of red and yellow rays, the light may be surrounded with a shade, coloured blue on the inner side: the blue rays reflected from the shade will produce a tolerably pure and white light by mingling with the reddish yellow rays of the flame. Another mode of improving artificial light is by surrounding the lamp with a glass chimney, tinged with a very pale blue, or by causing the light to pass through a fluid coloured blue. We may mention, that the hints as to tinting lamp-chimneys and glasses blue, has been extensively acted on, and very generally adopted. Some valuable remarks follow on the means of obviating the general pernicious effects of artificial light.

The Appendix treats of *Colour Blindness, Effects of the non-luminous rays upon the eye. Mode in which adjustment to distance is performed. Effects of Snow Blindness, and means of obviating them. Experiments of Sir Isaac Newton upon luminous impressions on the retina. Reflections by Milton upon his blindness. Particulars of Galileo's blindness.*

We recommend our readers, medical or general, to peruse this instructive little treatise. The subjects on which it treats are of a nature rendering it desirable that all should be, to some extent, acquainted with them. The hygienic treatment of vision rests mainly with the individual; and much valuable and trustworthy information may be derived from this book by almost every person. At the same time, the medical practitioner will find it a safe guide on a subject of constant importance.

PORTRAITS OF DISEASES OF THE SKIN. By ERASMUS WILSON, F.R.S. Parts I, II, III, IV. Fol. London: 1849.

We had occasion, in a recent number, to express our admiration of the plates by MR. DALRYMPLE on the *Diseases of the Eye*, and it is an agreeable duty to speak in terms not less eulogistic of the illustrations of *Skin Diseases* by MR. ERASMUS WILSON. In one respect, these diseases may be said to resemble ophthalmic affections,—namely, in the nicety which is sometimes required to discriminate between their varieties, and the practice necessary to enable us to treat them with confidence and success. Next to enjoying frequent opportunities of seeing these diseases in all their varieties, such plates as those before us afford invaluable assistance in forming a correct diagnosis. Very recently an officer, who had served much in the tropics, was expressing to us, with great bitterness, the indignation he felt at having been subjected, by the regimental surgeon, to a course of treatment for *itch*, when he was, in fact, suffering from *prickly heat*,—which was aggravated a thousand-fold by the sulphur inunction; and we know of a case where a gentleman, at Oxford, was pronounced by a physician to have a severe attack of *lichen*, when, in fact, his skin was reddened by a scarlet vest, in which he had been rowing a match! Such mistakes as these are never forgotten, and may do a practitioner irreparable damage. Had the medical men in question seen the beautiful plates before us, they would probably not have fallen into the errors they committed. The parts which have already appeared, illustrate the following diseases: Chloasma, Favus, Psoriasis Palmaris, Lupus, Lichen, Melanopathia, Leucopathia, Acne, Erythema, Urticaria, Melanopathia-Syphilitica, Lichen-Syphiliticum, Roseola-Syphilitica, and Lichen-Simplex,—which last is a perfect pictorial marvel.

The utility of this work is equal to its beauty; and it ought to be within reach of every medical man who may be called upon to treat cases of cutaneous disease.

THE HUNTERIAN ORATION, delivered before the Royal College of Surgeons of England, on the 14th of February 1849. By CÆSAR H. HAWKINS, Surgeon to St. George's Hospital. pp. 35. London: 1849.

Each succeeding year increases the difficulty of infusing interest into a discourse devoted to a special subject such as the present, from the complete manner in which the ground has been exhausted by previous orators. The oration before us is deserving of commendation, from the happy combination of Hunterian allusions with remarks on more recent investigations. The author touches lightly, but with effect, on the chief discoveries in chemistry, physiology, and pathology, which have emanated from the labours of modern observers, and shows that many of these had, in reality, been anticipated by the great physiologist, to the commemoration of whom the address is devoted. There are continually coming to light new proofs of the surprising genius of Hunter, and fresh evidence that he was greatly in advance of the age in which he lived. It is only now that many of his doctrines are beginning to be fully appreciated, and the truth of others fully established. As a composition, this oration is highly creditable.

DEPENDENCE OF ANIMAL MOTION ON THE LAW OF GRAVITY. By H. WIGLESWORTH, M.B. Parts I and II. 8vo, pp. 210. London: 1849.

The author states, that he has satisfied his own mind that animal motion is due to one great Law of Gravity. If we might venture on a pun, we should suspect that the gravity of some of his readers may be shaken by certain of his positions; for instance,—"That all motion in muscles is due to the pressure of the atmosphere on the surface of the muscle,—a vacuum having been previously formed within it by the union and condensation of gases"(!) p. 4. We give the author credit for considerable ingenuity in supporting his views; but we fear that he will not succeed in making many converts. To have a *hobby* is the failing of many: to be mastered by it, the misfortune of some.

1. A Brief Description of the Characters of Minerals, forming a Familiar Introduction to the Science of Mineralogy. By Edward J. Chapman. pp. 129. London: 1849.
2. Practical Mineralogy, or a Compendium of the Distinguishing Characters of Minerals. By E. J. Chapman. Illustrated with Thirteen Engravings. pp. 192. London: 1849.

Few persons possess greater opportunities for investigating the structure and products of the earth, than the medical officers of the army and navy. Called by the nature of their profession to all quarters of the globe; enjoying, in times of peace, considerable leisure; and inclined, by education, to habits of observation and reflection, it is, perhaps, less matter of surprise than of congratulation, that many of these gentlemen have contributed largely to science. *Ex uno disce omnes*—the name of Dr. Falconer must be familiar to all as the distinguished exponent of the palæontology of the Himalaya Mountains.

The want of a book on Mineralogy, which should combine the qualities of portability with conciseness, and yet convey all the information required to determine, chemically as well as scientifically, the characteristics of these valuable constituents of our globe, has long been felt; we ourselves have experienced it in days of yore, and have therefore the greater satisfaction in inviting attention to the volumes now before us.

The *Brief Description* is intended as an introduction to the *Practical Mineralogy*. It is really *multum in parvo*, and may be regarded as a pocket companion and guide to the traveller who wishes to make himself acquainted with the character of the minerals of the countries he traverses: it furnishes him with every particular required, including the mode of analysis. In the *Practical Mineralogy* the subject is treated of at greater length, and the author has so arranged his matter, that it is compact in form, and easy of reference, for instance—

"*Native Platinum.* Platine Bend. Native Platina Phil. Hexahedral Platina. M. H=4·0—4·5; sp. gr. 16·0—20·0; C. Steel grey, inclining to silver white; ductile and malleable; L. Metallic. It occurs in flat and rounded grains, and in small pebbles. Structure compact, uncleaveable, but the cube is assumed as the P. F. Infusible either alone or with the fluxes. Soluble only in heated nitro-muriatic acid, the solution yielding a yellow precipitate with the muriates of ammonia and potassa, and a dark brown precipitate with hydro-sulphuric acid, which becomes black when dry.

"C.P. Platinum is more or less mixed with small quantities of iron, rhodium, palladium, iridium, osmium. etc.

"P.L. Choco, etc., in South America, the Brazils, St. Domingo, Siberia, in alluvial deposits with native gold, Zucon's magnetic iron, sand, etc." (p. 133.)

Such is the style in which the book is written, and it is illustrated by 270 figures demonstrating the form and cleavage of crystals.

It will be seen that our opinion of these works is highly favourable; and to every one desirous of becoming acquainted with the interesting and useful sciences of Mineralogy and Metallurgy, we can conscientiously recommend them.

A Critical Treatise on the General Paralysis of the Insane. By James Winn, M.D. pp. 50. London: 1849.

This, which originally appeared in the form of a review, in the *Journal of Psychological Medicine*, is a good statement of the principal facts connected with the subject of which it treats; but it does not contain any thing calling for special notice.

CRITICAL DIGEST OF THE BRITISH AND FOREIGN MEDICAL JOURNALS.

ANATOMY AND PHYSIOLOGY.

THE PANCREATIC JUICE: ITS USES IN DIGESTION.

M. Bernard, of Villefranche, who has made some interesting researches on the digestive function, has been led to conclude, that the especial function of the pancreatic juice is to modify or digest the fatty matters contained in the food, and to facilitate their absorption by the chyliferous vessels. He distinguishes two kinds of pancreatic juice: 1, *Normal;* 2, *Morbid;* the latter being secreted in great abundance under inflammatory action. The former is a colourless, limpid, viscous, alkaline fluid, possessing no characteristic odour. Its taste is somewhat saline; and its tactile impression on the tongue is that of a viscous liquid. Like albumen, it is coagulable by heat, nitric, sulphuric, and hydrochloric acids, by metallic salts, wood-spirit, and alcohol. It differs, however, from albumen in this respect; that the precipitate produced by alcohol, when dried, can be readily dissolved in water, and possesses the same properties as before its precipitation; which is not the case with albumen. The morbid pancreatic juice is a watery fluid, having no viscocity, generally colourless, but sometimes opalescent, sometimes reddish. Its taste is saline and nauseous; its reaction is alkaline; and it is not coagulable by heat or acids. The transmutation from one to the other is gradual, and is shown by a progressive diminution of the coagulable material.

On exposure to a temperature of 40° or 45° cent., the pancreatic juice, in a few hours, exhales a nauseous odour, presents a cloudy deposit, and a peculiar aspect, arising from crystals of margarine, and it loses its property of coagulating by heat.

When two parts of fresh healthy pancreatic juice are mixed with one part of olive oil, fresh butter, mutton or pork suet, and exposed in a salt water-bottle to a temperature of 35° or 38° cent., there is soon formed a whitish, creamy emulsion, which is not precipitated at the end of fifteen or eighteen hours. It is evident that some chemical action is exerted in the fat: for at first, the mixture has an alkaline reaction, but becomes acid in five or six hours, evidently from an increase of glycerine and fatty acid. When butter is used, butyric acid can be detected by its odour, at some distance from the vessel. M. Bernard states, that no other animal fluid possesses this property: and it is not possessed by the pancreatic fluid in its morbid state. The function of the pancreatic fluid then seems to be, to render the fatty matters absorbable, by the formation of a white, homogeneous liquid, which is absorbed by the lacteals. The proof of this is, that the fat, which is unchanged in the stomach, becomes, below the orifice of the pancreatic duct, of a totally different character. If the pancreatic duct of a dog be tied, the fat remains unaltered in the small intestine, and the lacteals only contain a limpid chyle, without any admixture of fat. In rabbits, where the pancreatic canal opens at a considerable distance below the biliary duct, the fat contained in the food remains unaltered till it arrives at the orifice of the pancreatic duct, and the lacteals contain no fatty matter above this point. The experiments of Sir B. Brodie were made on cats, in which the pancreatic and biliary ducts open by a common canal, so that he included both in the ligatures which he applied. He was led to conclude, that the bile acted on the fatty matters; but M. Magendie, in tying the *ductus choledochus* of dogs, which is distinct from the pancreatic duct, did not obtain the same result. The apparent contradiction in these experiments is considered by M. Bernard as confirmatory of his views. [*Archiv. Gén. de Méd.* Janvier 1849; *L'Union Médicale*, 13 Fev., 1849.]

ABNORMAL MUSCULAR AND ARTERIAL DISTRIBUTION IN THE LEG.

The following anatomical peculiarity is described in the *Lancet*, of April 21, 1849, by a student of the Andersonian University at Glasgow :—

"This muscle, situated in the posterior region of the leg, arose from the fibula, its central point, by a thin aponeurotic slip, from the deep crural fascia and intermuscular septa, becoming fleshy, and ending in a rounded tendon; it descended behind the internal malleolus to be inserted into the outer edge of the tendon of the flexor digitorum longus, previous to its division, lying in its course between this and the flexor pollicis longus muscles. At the astragalus it crossed the latter, and became continuous with the musculus accessorius.

"In the opposite extremity of the same subject, a similar muscle existed, but different in origin and development. It arose from the lower fourth of the fibula, thick and fleshy, passed obliquely inwards behind, or posterior to the flexor pollicis longus, and received the insertion of the musculus accessorius, as the former.

"This muscle, in the latter situation, has been observed in a few instances by the learned Professor of Anatomy in the above Institution, but usually connected with either the flexor pollicis or the plantar fascia. From its origin, direction, and insertion, it might be appropriately called the musculus accessorius secundus, or longus.

"In the former instance, besides acting as an auxiliary to the long flexor, and correcting the obliquity of its action, taking the insertion as the fixed point, it would make tense the deep crural fascia, and thus give increased power to the muscles beneath it. The relations of the parts were rendered still more important and interesting by the presence of an abnormal distribution of the posterior tibial artery, which passed beneath the above and the flexor pollicis longus muscles, in contact with the interosseous membrane, and descended to the os calcis, curving round it in relation with its inner tubercle, to become the external plantar. The peroneal and internal plantar arteries were wanting. The posterior tibial nerve lay to the inner side of the artery in the latter part of its course, separating it from the flexor tendons."

The Editor of the *Lancet* observes, "The above communication was accompanied by a drawing, which we have not thought it necessary to publish, as the writer has so well described the irregular distribution in question. Instead of considering the abnormal fasciculus as a high origin of the musculus accessorius, we, under the belief that the flexor longus and musculus accessorius are one muscle, are inclined to regard it as a fibular and fascial origin of the flexor longus digitorum. The fibular course of the posterior tibial artery is not very uncommon; but it serves to illustrate the fact, that aberrations of anatomical structure, when they do occur, have a tendency to be multiple."

PRACTICE OF MEDICINE AND PATHOLOGY.

STEATOSIS, OR ADIPIFICATION OF MUSCLE.

In the *Edinburgh Medical and Surgical Journal* for April 1849, Mr. Hallett relates a case of Steatosis, which he witnessed in the dissecting room of the University of Edinburgh, in the session 1846-47, and adds some remarks on the nature and general characters of the transformation.

William Speed, æt. 78, died of paralysis, on the 8th of December 1846. His body was removed to the University for dissection: it presented the appearance of having belonged to a strong robust man. On examination, the muscles, with but few exceptions, were found to have undergone fatty degeneration. Some had been apparently entirely transformed into adipose tissue, among which were all the muscles of the back, face, and scalp, with the single exception of the *latissimus dorsi*, which was only partially changed.

Others had been partially transformed, many of these having three-fourths or more of their muscular appearance destroyed; the remaining portion, though wearing a fleshy aspect, presented very evident indications of the process of adipification having been in full force, up to the time of death. A few of the muscles retained more of their normal appearance, a small portion only having been converted into fat; or the adipose matter having been equally and more sparingly distributed throughout the muscle, so as to give it a mottled aspect. The heart also, besides having its surface loaded with more fat than ordinary, had its substance loaded with fatty matters to near the inner surface of its several cavities.

Mr. Hallett cites examples of the fatty degeneration of muscle from Dumas, Vicq d'Azyr, Maugre, Cruveilhier, Louis, and Emmanuel; and states that other cases have been seen and mentioned by Salzmann, Leuwenhoeck, Albinus, Haller, and many other anatomists.

It would appear that fatty transformation is strictly confined to the striated muscular fibres, including the voluntary muscles and the heart. In the latter organ the fat is deposited towards the surface, the inner fibres and the *columnæ carneæ* being free from it. The lower animals are not free from this morbid state; it has been observed in sheep. In monsters by excess, Mr. Hallett has never observed it; but in cases of monstrosity by defect he has found the muscles replaced by fat, without being able to assure himself that muscular fibres had ever existed in the situations thus occupied.

Adipification of muscle is the result of diseases, which prevent the due exercise, and consequently interfere with or pervert the nutrition, of the muscles. Among these are paralysis, either from disease of the nervous centres, or from injury to the trunk of a nerve, rachitis in its more aggravated form, club-foot, unreduced dislocation, and, occasionally, according to Cruveilhier, old ulcers.

With regard to the minute anatomy of the diseased structure, Mr. Hallett says he has been able to determine that the fat is first deposited within the sarcolemma, where it is found in minute globules, closely packed together, and arranged for the most part in linear series. In this stage of the process there may also be occasionally seen a few perfect fat corpuscles, enclosed within the sarcolemma, filling up its entire breadth, and sometimes causing it to bulge outwards. Whether the fat globules are contained within the myoline, or whether they merely displace it, the author of the paper says he has not been able to determine. He thinks it certain, that there is no appreciable diminution in the amount of myoline, as he has been able to dissolve out the fat by sulphuric ether, the ultimate fibril retaining its normal appearance.

In a more advanced stage, the adipose corpuscles and globules have greatly increased in number within the sarcolemma; and if the fibre be treated with ether, they will almost entirely disappear, and but few of the corpuscles characteristic of muscle will be found where the fatty matters were most abundant. They have for the most part disappeared, or, more likely, have entirely changed their character. In this stage of degeneration, adipose matter can be detected, sparingly distributed in the areolar tissue connecting the fibres. When the muscle is apparently wholly converted into fat, myoline, though in very small quantity, can still be detected by the microscope. It is not uncommon to find the sarcolemma ruptured, and one or more fat corpuscles proceeding from it, evidently not from the manipulation necessary for preparing the fibre for examination, but from a diminution of the elasticity and power of coherence of the sarcolemma, consequent on the deposition of fat within and around it. The only other change worth noticing was observed to be a greater relative amount of fat globules around the fasciculi of fibres, probably from a breaking up of the sarcolemma, at least to a great extent. The appearance of fatty muscle has been described by Vicq d'Azyr and Cruveilhier; the former of whom states emphatically, that it is not between the fibres that the fatty matters are deposited, but within the elements of the fibres themselves.

Analogy would lead us to suppose —though the point cannot be determined in a satisfactory manner—that the fatty matter is deposited within the cells of the myoline, and these become fat cells. In the liver and kidney, the fat is first deposited in the secreting cells; and this, taken in connexion with the disappearance of myoline in proportion to the increase of fat within the sarcolemma, would tend to support such an hypothesis.

The transformation of muscle into fat takes place slowly ; and commences at the external part, both in the long muscles of the extremities, and in the flat muscles, as of the anterior abdominal walls. The deposition of adipose tissue appears to proceed *pari passu* with the removal of myoline, so that no difference in size can be detected ; this has been distinctly mentioned by several, as Vicq d'Azyr and Cruveilhier. The muscles which have undergone this change are either of a dirty clay or a lemon colour; those in young subjects being of a much deeper yellow hue. They offer considerable resistance to the scalpel, in dividing them, as much as when in their normal state.

Chemical analysis shews the presence of fat. This has been determined by Cruveilhier ; and Mr. Hallett examined a portion of the *pectoralis major*, weighing one ounce avoirdupois, which yielded only two scruples of substance not fatty ; and only forty-six grains of residue were obtained from a similar portion of the *rectus feneoris* (free from tendon), the rest being fat. Gluge reports that he has obtained salts from fatty muscles in rachitic subjects.

Two conditions of muscle are liable to be confounded with fatty degeneration. The first is not unfrequently found in old decrepit individuals, and consists in the deposition of fat in the areolar tissue connecting the fibres of the muscles. The second is seen both in young and old subjects, especially in the lower part of the trapezius and the deltoid muscles ; and consists in the loss of the usual fleshy appearance of the muscles, the fibrillæ being also smaller and paler, but still preserving their elemental structure unchanged.

Mr. Hallett does not seem to have been aware of the valuable remarks on fatty degeneration contained in the Lectures on Nutrition, Hypertrophy, and Atrophy, delivered by Mr. Paget, in the Royal College of Surgeons, in 1847, and published in the *Medical Gazette* for that year. Mr. Paget considers, that fatty transformation of muscle is a process of degeneration, and that it is accompanied by a proportionate disappearance of the nuclei, which he believes to be important agents in the process of healthy organization. In Lecture V, he says, " Fatty matter is probably one of the products of the spontaneous transformation of tissues at the end of their vigorous existence ; and this form of atrophy only represents the state of a tissue remaining unrepaired, after it has fallen into the ordinary course of degeneration. The possibility of fatty matter being formed in the transformation of protein compounds, is certain from the observations of Wurtz, that butyric acid is one of the compounds formed by the decomposition of fibrine in the open air. And that the fat, which we find in the muscles and gland-cells is really not a deposit put into them from without, but one of the products of the change of their own contents, is made probable by the frequency with which, in muscular fibres, we find the fat particles arranged in the same way as the proper constituents of the fibril ; sometimes in transverse, sometimes in longitudinal rows. Indeed, one is constantly tempted, in the examination of these specimens, to think that we can trace all the transitions from the " sarcous elements" of the muscular fibril, and the granules of the gland-cell, to the little oily particles, which, by clustering, and then fusing with others, at length make the great oil-globules which fill the cell. What we see in the degenerating normal tissues, is fully confirmed by the corresponding changes taking place in anormal products, of which Rokitansky adduces eleven classes of instances, in which protein compounds are replaced by fatty matter in such conditions, that it is hardly possible to assume anything, but that the

fat is one of the products of spontaneous transformation of the higher compound."

In Lecture VI, Mr. Paget says, that the whole muscle may appear pale, bleached, or of some yellowish or tawny hue, soft, and easily torn. But a more frequent appearance in the voluntary muscles, is alternation of healthy and diseased tissue. Of the degenerated tissue, some may present, in place of transverse striæ, minute dark dots in transverse lines; some, oil-globules on the interior of the sarcolemma; in others, these are more and more abundant, to the proportionally greater exclusion of the proper constituents of the fibres. He observes, that it is not unfrequent to find a portion of the lower and posterior part of the *recti abdominales* in a state of fatty degeneration.

EDINBURGH FEVER OF 1843-44.

Dr. Cormack has reprinted from the *Medical Gazette*, of April 13th, 1849, the following communication, for the purpose of being added to his work on the Fever. The most important point in the paper is the declaration in favour of typhus being truly an exanthematous disease, and therefore quite distinct from the Edinburgh Fever of 1843-4.

"Having long had nearly ready for the press a considerable supplement to my Monograph on the Epidemic Fever which prevailed in Edinburgh in 1843-4, I have hitherto refrained from obtruding the following remarks upon the readers of the *Medical Gazette;* but having resolved, from the incompleteness of some of my materials, to delay, and alter the plan of, my appendix, I now desire to make a short personal statement on one or two important points, regarding which I am unwilling any longer to be misunderstood.

"In making this communication, it is not necessary to criticise the opinions or impugn the statements of any one. I desire simply to place my own views in a correct light, and to re-assert and vindicate that claim to scrupulous accuracy as to facts, which was set forth in my introductory chapter. 'The main object,' I there said, 'in what follows, is to present a faithful account of the natural history and pathology of the prevailing epidemic, along with such details of the treatment followed, as appear to be of practical importance. Every fact stated is put forth almost in the very words in which it was noted down at the moment of observation;— a practice which ought to be considered imperative on all who venture to lay the result of their experience before the profession. It cannot be denied, that great hindrance has accrued to the improvement of the science of medicine, from physicians describing the phenomena of disease, and the supposed effects of remedies, from general impressions remaining in their minds after the lapse of hours, days, weeks, or even longer intervals,—in place of founding their statements upon an analysis of facts committed to paper at the very time they were being observed, at the bedside of the living patient, or at the dissection of the dead.' (p. 1-2.[1]) Lest the reader of Dr. Wardell's papers should be impressed with the idea, that I did not observe and record the phenomena of the Epidemic Fever in the way to which I lay claim, I beg to state that I scrupulously followed out the laborious method recommended in the above extract.

"The only two points to which I now wish to call attention, are my remarks on the *State of the Blood*, and on the question as to the *rosy elliptical Eruption* (of typhus) being '*always*,' or '*almost always*,' absent.

"I. State of the Blood. In the course of my observations on this subject, I say—'Professor Allen Thomson had the goodness to lend me his able assistance, in examining the blood of a number of my patients by means of the microscope. A few drops were taken from the thumbs, on the same day (24th Oct.), of about a dozen persons, some of them in the pyrexial, and

[1] Natural History, Pathology, and Treatment of the Epidemic Fever at present prevailing Edinburgh and other towns. Churchill, London: 1843.

others in the apyrexial stage of the disorder; and it was found, that in all of them, there was an unusual number of pus-globules; and in some cases, in addition to this, all the globules were found serrated and notched. One gentleman, present upon this occasion, was observed to have his blood exactly in the same state as the fever patients, and within two days he was seized, and went through two mild attacks, or to use conversational phraseology—*the fever, and the relapse.* The blood of some other healthy persons was also examined at the same time: it exhibited nothing unnatural, and none of these latter individuals have taken the fever, although a month has now elapsed since the observation was made.'—*Cormack*, p. 113-114.

"Dr. Wardell, in speaking of the blood, thus comments on the above statement:—

"On being drawn from the veins, it was of a less formative consistence than natural, and Dr. Cormack says that the 'crassamentum was a spongy mass, instead of a firm fibrinous clot.' That author also says that the microscope revealed lesion, as evinced by the presence of pus-globules, and in addition, that the globules were found serrated and notched. From inquiries made personally of Professor Allen Thomson, who instituted the researches, it appears that there must have been some misunderstanding on the part of Dr. Cormack, as the former did not corroborate the statement which is made by the latter in his work. Pus-globules certainly did not exist in the blood. In order to be fully satisfied on this point, I procured the blood of a number of patients in different stages of the disease, which my friend and late teacher Dr. Hughes Bennett (whose histological acquirements, especially with regard to morbid anatomy, are well known to the profession), had the kindness to carefully examine, and this gentleman assured me that no pus-globules existed, nor yet the serrated and notched appearance as reported to have been observed by Professor Allen Thomson."—Wardell. (Reprint from *Med. Gaz.* pp. 83-84).

"There was no 'misunderstanding' on my part. I have now before me the original notes, drawn up by Dr. Allen Thomson and myself, of the observations made on the 24th of October, 1843, which were intended to be the commencement of a series, which, unfortunately, we found it impossible to continue. These notes were made at the time of observation, with the blood still under the microscope, and are illustrated by numerous sketches by Dr. Allen Thomson of the notched and serrated blood-globules. The following is an exact transcript of a portion of our original minute, in the handwriting of Dr. Allen Thomson:—'24th October, 1843. Observations made on the blood. 1. *James Laing.* Blood contains a large quantity of colourless globules, of two sizes: one set slightly larger than the blood-globules; the other fewer in number, and exactly similar to the globules described as pus-globules. 2. *Rose.* Globules very much broken up, and ragged on the edges; very few colourless globules; a *few* of the largest size," etc., etc. In the other ten cases, we have noted similar appearances almost in the same words.

"I do not wish to attach much value to the above observations of one day, as illustrating the state of the blood in an epidemic which lasted for many months. I merely protest against these observations, which were carefully made, and as faithfully recorded, being described as a 'misunderstanding'—upon the faith of Dr. Wardell's reminiscences of a conversation with Dr. Allen Thomson, and on Dr. Hughes Bennett's microscopic observations, made, I have no doubt, with skill and accuracy, but *made at a different time, on the blood of other persons*, labouring, I believe, under *another kind of fever.*

"When the objects were being looked at, I remember Dr. Thomson stating, that he was always distrustful of microscopic observations made on the blood corpuscles; and more especially as to the jagged appearance of their margin, as he thought he had seen a great variety in the phases of that appearance, according to differences in the mode of observation, such as the way in which

the blood was spread on the glass, the time it was allowed to remain there, the degree of drying before it was covered, and the state of cleanness of the glass plates. It was, therefore, with these sources of fallacy present to my mind, that I avoided generalizing, and strictly confined my statement to what had been actually seen in the blood of twelve persons, on the 24th of October, 1843. It must be admitted, however, that in so far as a limited number of observations are to be trusted (and with the reservations implied above), there is reason to believe that we saw, in the blood examined, an abnormal degree of the ragged margin, as well as a greater number of the corpuscles called pus-globules. It is, not, however, because I attach importance to these microscopic observations, that I have said so much upon the subject, but because I feel that whatever faults may be charged against my work, it has the merit of being as faithful a record of my experience of the fever, up to the date of its publication in December 1843, as could have been produced. No one could have been more pains-taking; for every case was written with my own hand, or to my dictation, at the bed-side, and in the anatomical theatre, by my accomplished assistants, Dr. Heude and Mr. John W. Reid.

"II. The Eruption. At page 84, in summing up the distinctive characters of the disease, I say—'*The rosy elliptical eruption is absent in almost every case in the present epidemic.*' Had my work been published at the close of the epidemic, or even some months later[1], the word 'almost' would have been deleted from the above sentence. I had then become quite satisfied that the doctrine first promulgated by Professor Henderson, in his clinical lectures[2], and soon generally adopted in Edinburgh, was correct—viz., that the eruption characteristic of typhus had never occurred in the "relapsing" epidemic of 1843-44; and that the two fevers were the products of different morbid poisons. This fact became very strikingly manifest towards the close of the epidemic to which my monograph refers, when the ordinary Edinburgh typhus began to rage. We had our convalescents from the expiring epidemic of the relapsing fever frequently seized with the exanthematous typhus then setting in; till such time as typhus cases were kept apart from those recovering from the relapsing fever. I have notes of nineteen patients who went through unequivocal attacks of both fevers; and other physicians, I know, kept records of a much greater number of similar instances. I forbear at present enlarging upon this question, as it is enough to say, that the evidence was so palpable and overwhelming, that (upon the unanimous representation of the physicians) the managers of the infirmary and fever hospitals framed rules to save those convalescent from the first epidemic from the exposure to the contagion of the incipient typhus epidemic. I believe the care with which these rules were framed, and the zeal with which they were enforced, saved many lives.[3]

"In speaking of my views regarding the eruption, Dr. Wardell seems (I believe without intending it) to accuse me of dogmatism. 'Dr. Cormack,' says he, 'comes, and rather sweepingly, to the conclusion, that the elliptical spots were observed in epidemic cases, although he is enabled to indicate but one individual,' etc. I erred, as I soon discovered, and have now admitted, as to the case referred to; but when I proclaim this error, and unreservedly give in my adhesion to Dr. Henderson's doctrine, I must, in justice to myself, be allowed to extract the following paragraph, as it shows, that from the very first, I contemplated the chance of having to alter or modify my opinion:—

'If some think,' said I, 'that on this point there has been exhibited an

[1] My work was published on the 20th December 1843.

[2] Afterwards in the Edin. Med. and Surg. Journal for January 1844.

[3] "Typhus" and "Typhoid" are often used by authors as synonymous terms; but it is best to adopt the latter only as descriptive of symptoms common to many fevers, and to employ the former exclusively as the name of the exanthematous (or true) typhus; which, like the other exanthemata, almost never affects the same individual more than once.

undue reluctance to enter fully upon an important pathological inquiry, I beg to remind them, that data are yet wanting to entitle us to discuss it fairly, and with profit. This may be attempted in a subsequent publication, at the close of the epidemic ; in the mean time let the remark of Rousseau be remembered, 'that the truth is in the facts, and not in the mind which observes them'; and it is hoped that some important facts have been even here communicated as contributions to this part of the pathology of the fever.' (*Op. cit.* p. 107.)

"Though I have much to add to, I am anxious to announce that I have little to alter in my description of the epidemic of 1843-44.

"It was thus that I summed up :—

"THE POSITIVE AND NEGATIVE CHARACTERS OF THE DISEASE.

'The present epidemic possesses positive and negative characters, strikingly distinguishing it from the fever which generally prevails in Edinburgh, viz.,

'1. The sudden and violent invasion of the disease.

'2. Bronzing, leadening, or purpling of the countenance before and after seizure.

'3. The almost uniform occurrence of one or more relapses.

'4. The unusual number of cases with yellow skin, black vomit, and hæmorrhage.

'5. The short duration of the pyrexial state, and its mode of termination.

'6. The severe muscular and articular pain.

'7. The rosy, elliptical eruption resembling measles is absent in *almost* every case in the present epidemic.

'Whilst these are the principal characters which distinguish the two epidemics, they also exhibit other marked differences : for instance, in that which now prevails—

'8. Severe vomiting is much more common ; as are likewise gastric, gastro-hepatic, gastro-splenic, and gastro-enteric symptoms.' (*Op. cit.* p. 84.)

"The amendment which I have to make on the above summary, is simply the deletion of the word 'almost,' in the seventh paragraph ; but it is so important and essential a correction, that it has seemed proper to make it thus publicly."

SURGERY.

LUMINOUS SPECTRA EXCITED BY PRESSURE—DIAGNOSTIC OF AFFECTIONS OF THE RETINA.

THE April number of the *Edinburgh Medical and Surgical Journal* contains an article, by Dr. WALLER, on the Luminous Spectra excited by Pressure on the Retina, and their Application to the Diagnosis of the Affections of the Retina and its Appendages. He considers them as produced by, 1st, Temporary pressure on certain parts of the eyeball ; 2nd, Sudden rotation of the eyes ; 3rd, Sudden rotation of the head ; 4th, The effect of straining ; 5th, Continued pressure of the brain when divested of the cranium ; 6th, Compression on the head ; 7th, Voltaic and tension electricity ; 8th, Pathological conditions of the retina, optic nerve, and brain, idiopathic or sympathetic. In the present article, the four first causes only are treated of. The effect of pressure on the globe, produced by introducing the finger between it and the orbit, is to give rise to spectra varying in brightness according to the point to which pressure is applied, the brightest appearances being caused by pressure on the upper segment. The spectra of the upper and lower segments consist of several concentric rings alternately dark and bright ; Dr. Waller has never been able to detect the variegated or irisate colours mentioned by Newton ; the spectra appear more vivid in the dark than by daylight, and their brightness is further increased by remaining in the dark some time. The images always appear at a point diametrically opposite to the point com-

pressed. Sir D. Brewster states that these luminous circles continue as long as pressure is applied, but Dr. Waller has found their duration in the dark to be that given by Newton, viz., about the space of a second. Dr. Waller agrees with Muller, that by means of the luminous spectra excited by pressure, we may demonstrate the simultaneous action of the homologous points of the two retinæ.

In the dark, sudden lateral movements of the eyes give rise to two bright circular rings enclosing a dark area, equally bright in both eyes, and appearing nearly in the centre of the field of vision. When the same movements are made in open day with the lids shut, Dr. Waller perceives two circles differing slightly from each other; that on the left being a circle of faint light, brighter at the circumference, and becoming gradually more dim towards the centre. The circle on the right is bright at the borders, and of a dark bluish colour within, which speedily clears away. (*Abridged from Edin. Med. and Surg. Journal, April* 1849.)

The practical deduction drawn by Dr. Waller is, that material assistance may be derived from these phenomena in the diagnosis of obscure cases of disease of the eye, where it is difficult to determine whether the seat of disease is the retina or not. We have for some time past been in the habit of applying the test, and fully agree with the author of this paper, that it is occasionally of much value. So far as our observation goes, the faintness or absence of the spectre produced by pressure, is a fair test of the condition of the retina; for in amaurosis which has made some progress, they are very faint; in complete amaurosis, they cannot be excited. Whereas, if the lens be the seat of disease, and the retina sound, they can always be produced. We may, however, give a caution; namely, that experiments of this sort, and that of holding a candle before the eye to observe the reflected images, should not be used if there be symptoms of congestion or inflammation of the choroid or retina; we have seen such cases decidedly aggravated by rough usage of this description.

REMARKABLE DISEASE OF THE SCROTUM.

Mr. Canton lately related the following case at a meeting of the Westminster Medical Society:—A gentleman, aged 45, who had always resided in a warm climate, was for several years afflicted with a swelling in the left side of the scrotum, which had gradually attained the size of a small melon. The tumour was oval, extending to the external abdominal ring, and the spermatic cord was obscurely felt behind; the testicle was nowhere to be distinguished; the surface was uniform, and the scrotum natural and unadherent; and the diagnosis was otherwise obscure. A small portion at the anterior surface was found to be soft and elastic. The case was considered to be one of long-standing hydrocele, with the tunica vaginalis considerably thickened; and a trochar was consequently passed into the tunic, through the fore-part of the tumour, at its least-resisting part. There flowed at once through the canula a thick, unctuous, brown fluid, which was found to coagulate by heat. The size of the tumour remained the same as before the operation. A few days afterwards, a considerable amount of lighter-coloured fluid was drawn off; and, at the next visit, it was determined to lay open the sac, and endeavour to promote granulation by filling up its cavity with lint. An incision was made, extending from the upper to the lower part, through the cyst, the walls of which were nearly an inch in thickness; the testicle was now seen within, situated lower down than in ordinary hydroceles, and appeared to be in every respect healthy. The patient suffered much from nausea, sickness, and constitutional irritation. At the expiration of a few days, these symptoms having abated, and the interior of the sac being found in a sloughy state, it was deemed advisable to remove, by the knife, the whole of the disease. Mr.

Canton, therefore, carefully dissected the cyst,—which was almost as consistent as cartilage,—from the fore-part of the spermatic cord, and from around the testicle, so as to leave the latter, which was perfectly healthy, unencumbered, and suspended by the former. No part of the scrotum was removed; and, at the close of the operation, the line of incision made in it was so shortened, that the testicle could scarcely be returned to its place through the wound. Healing progressed favourably; and the patient has since remained perfectly free from any inconvenience. [*Lancet*, March 31, 1849.]

OBSTETRICS.

THE CLIMACTERIC DISEASE IN WOMEN: A CEREBRAL DISORDER NOT HITHERTO DESCRIBED.

Dr. Corfe, of the Middlesex Hospital, gives, in the *Medical Times*, April 7th, 1849, some account of a cerebral affection attending the decline of the catamenia and other disordered conditions of menstruation, attended by many of the symptoms of epilepsy, but in a less exaggerated form than exists in this disease. He refers this disorder to uterine disturbance; and gives a variety of facts respecting the paroxysm, and the condition of the skin, liver, kidneys, and brain, which obtains during the attacks. He insists greatly on the importance of distinguishing between this affection and diseases of the brain. The treatment recommended by Dr. Corfe, consists chiefly of cholagogue purgatives and antacids. When he wrote this paper, Dr. Corfe considered he was describing a peculiar and important cerebral affection for the first time.

The *Medical Times* of April 21st, 1849, contains, however, a communication from Dr. Tyler Smith, preferring a claim to the prior description of the same disease, in the Appendix to his work on Obstetrics. The following is Dr. Smith's account of the malady:—

"Peculiar Malady Incident to the Decline of the Catamenia. There is a peculiar malady which has never been described, belonging to the period of 'the change of life', or the catamenial crisis, and allied in its nature to sphagiasmus (compression of the veins of the neck), which I shall take some future opportunity of elucidating fully. The so-called 'heats and chills' of this period consist of a real paroxysmal affection, allied in its nature both to intermittent fever and epilepsy, particularly to the cerebral variety of the latter; sometimes it terminates in epilepsy, or mania, or even apoplexy. In fact, this malady is a fruitful source of mania, occurring in the female after the decline of the catamenia. The disorder I refer to, appears to consist of compression of the veins of the neck, and distention of the cerebral circulation, attended by vivid sensations of heat, flushing of the face and neck, with giddiness, almost amounting to insensibility. These symptoms are soon followed by relaxation of the neck, great coldness or chills, and faintness, with perspiration over the whole surface of the body. The paroxysms are sometimes so violent as to wake patients out of their sleep, and the apprehension of the attack produces the greatest uneasiness in excitable patients. These paroxysms occur many times in the twenty-four hours, in women of delicate health, at this epoch. Let any practitioner inquire and analyse the symptoms of women at the catamenial decline, and he will find the affection, of which I have given the outline, to be very common; it is a most important subject of study, as being the basis of many of the disorders of the nervous system, which occur after the cessation of the catamenia."

It is not a little curious, that before the appearance of Dr. Corfe's paper, we had made arrangements with Dr. Tyler Smith for a paper on this subject, in which the so-called climacteric disease should be traced fully in all its relations. This communication we hope shortly to lay before our readers.

REPORTS OF SOCIETIES AND ACADEMIES.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

Eighth Meeting of Session 1848-49. March 13.

Dr. Addison, President, in the Chair.

Case of Apoplexy of the Cerebellum. By R. Dunn, Esq. The patient was a man, 52 years of age, whose sight had for some years been much impaired, from an amaurotic affection. The author was first called to attend him in June 1843, when he was suffering from cephaloma and febrile disturbance. This attack left his sight more impaired. About two years ago, he became unfortunate in business, and from that time his mind was weak and excitable. On the last day of April 1848, he was seized during the night with sickness and faintness, and, getting out of bed, fell, as it was thought, in a fainting fit. The author found him in a low, exhausted state, and cold, but complaining of pain, heat, and uneasiness in the back part of his head. The latter symptoms continued for some days. There was no paralysis, but his mind was weaker, and more confused than before, and his emotional excitability increased. Early in May, his wife mentioned that he had become subject to a constant desire for sexual intercourse; that his conduct in this respect was very different from what it had been before his late attack. By the advice of the author, he left home for about three weeks, without his wife. On his return, the desire of sexual intercourse was abated, and from this time was gradually lost. There was now observed an unsteadiness of gait, which increased, and for some time before his death was attended by weakness and stiffness of the left leg and foot. On the 6th of September, he was seized with an apoplectic attack, and died in less than four hours. After death, the vessels on the surface of the brain were found turgid. The convolutions of the brain were shrunken, deficient in firmness, and of a dingy-yellow colour. The optic nerves, shrunken and of a dingy colour, were, together with the substance of the brain around them, in the cerebral part of their course, softened. The whole region of the meso-cephalon had an unhealthy aspect. The interior of the right hemisphere of the cerebellum was a softened, pulpy mass, in the midst of which was an apoplectic clot, of the size of a pullet's egg. The softening extended inwardly, beyond the centre of the median lobe, implicating the fibrous strands of the middle and inferior planes: and outwardly, to near the surface of the hemisphere. The whole arterial system of the brain presented the diseased condition, which results from cartilaginous and osseous deposit between the coats of the vessels. This state was remarkably apparent in the vertebral arteries, especially in the cerebellar branch, from which the hæmorrhage appeared to have taken place. The author regards the state of the vessels as the primary cause of disease. He believes that the first attack in April was of the same nature as the fatal seizure. Around the first apoplectic clot, inflammation, he thinks, was set up in the cerebellum, and this terminated in disorganization. To the inflammatory state of the cerebellum he refers the exaltation of the sexual propensity; to the state of disorganization, the depression of that feeling, and the disturbance of the powers of locomotion—namely the tottering gait, from defective power of co-ordination, ending in a weak and stiffened condition of the left leg. He argued that the medium lobe of the cerebellum is the sensory ganglion of the sexual instinct, and belongs to the same category with the optic, olfactory, and auditory ganglia; while he thinks the two cases he has noticed, afford pathological proof that another office of the cerebellum is that of a regulator and co-ordinator of the muscular actions, especially of those subservient to locomotion, and to the maintenance of the equilibrium of the body.

Professor Owen regarded the sexual sense, as it had been termed, to be an exaltation of ordinary sensibility, and to require a special centre no more than ordinary titillation of nervous extremities in other parts of the body; in proportion to the general exaltation of the sensory system, would doubtless be the enjoyment of the sexual sense. With regard to the inference drawn from the signs of inflammation and disorganization of the cerebellum, in their relation as the cause of the excessive proneness to venery, he thought much caution and reserve were called for, before assuming such relation. The sexual phenomena, to which the author's attention had been specially directed, might be the result of the morbid state of the cerebellum reacting on some other part of the nervous centres, more directly connected with the source of the sensations of the sexual system.

Dr. Marshall Hall. I quite agree with Professor Owen that there is no sufficient reason for supposing that the cerebellum is the seat of the sexual passion. The exasperation of this passion in the case before us, is little to the purpose. There was vomiting and faintness. Is the cerebellum the seat of the functions to which these affections respectively belong? The medium lobe of the cerebellum cannot be affected without the contiguous medulla oblongata being affected too, by irritation or pressure. Which of these, then, was the organic seat of the sexual passion used to excess in the case before us? By the experiments of Segalas, we learn positively that the medulla oblongata is a seat of sexual excitement, for irritation of this part of the nervous centres led to erection and emission. Even in the human subject, sexual phenomena have been observed in cases of injury to the neck, consequently below the seat of the cerebellum. The phenomena of strangulation, in its fatal, and in its slighter degree, afford evidence of the same kind: in the former case there are erection and emission; the latter has been used by the profligate sensualist to induce sexual excitement. The question is a complicated one.

Dr. Carpenter expressed a strong sense of the physiological importance of such communications as that of Mr. Dunn, and addressed himself to some of the remarks made by Mr. Owen, who had not, as it seemed to him, correctly apprehended Mr. Dunn's views. Although he had always been strongly opposed to the doctrine, that the cerebellum, as a whole, is the organ of the sexual instinct or propensity, yet he thought that much evidence had been adduced, tending to show the presence of a ganglionic centre for the sexual sensations, either in the central lobe of the cerebellum, or in the upper part of the medulla oblongata; and the limits of these parts were not so accurately defined, as to make the allocation of it in one or the other a matter of much consequence. He considered that the case recorded by Mr. Dunn added weight to this view. He could not admit the validity of Professor Owen's argument, that the presence of the results of inflammation negatived the idea of the connexion of the lesion, in its earlier stage, with the affection of the sexual feelings described by Mr. Dunn.

Mr. W. F. Barlow thought the case of Mr. Dunn very doubtful as to the light it threw on the much disputed and most unsettled point of the functions of the cerebellum, but very valuable as a contribution to the history of apoplexy, from the care with which the symptoms were observed, the length of time occupied by their observation, and the clear account given of the post-mortem appearances. As to the cerebellum being the organ of sexual passion, Mr. Barlow would take leave to remind the Society of the remarkable case detailed by Cruveilhier, of a female who was sexually excited to a high degree, but was found after death to be deficient in that part. That it was possible for coitus to be effected without the aid of either brain or cerebellum, would appear from what happened in paraplegia.

Mr. Streeter had listened with pleasure and attention to the remarks of Professor Owen, because he well knew the profoundness of his inquiries, and the rare and extensive opportunities which fell to his lot; but he must

say, that in his judgment, the Professor had confounded things essentially different in their nature. He had sought for a relation of size between the cerebellum and the copulative and breeding organs, which does not exist in nature ; and, assuming this relation of size to be a phrenological datum, he builds his adverse reasoning upon it. Experimental physiology had shown, that injury or removal of the cerebellum disturbed or destroyed the motive powers, and many persons have inferred from this, that the cerebellum was the co-ordinator and regulator of all voluntary motion whatever. The error here consisted in assuming a part for the whole. He expected far more from observations made with such minuteness, and detailed with so much care, as the author had employed in this case, than from mutilation, and the so-called removal of the cerebellum and cerebral hemispheres. He was astonished that any anatomist could place confidence in the inferences drawn by M. Flourens from such experiments.

Mr. Dunn had only one observation to make: while he fully concurred in the justness of what had been said by Professor Owen and Mr. Travers, as to the effects of inflammation in depressing and destroying the functional powers of a part, he felt assured they would agree with him, that in the incipient stage of the inflammatory process,—the stage of irritation, if he might use the expression,—the first and immediate consequences were nervous excitement, and exaltation of the functional powers.

Ninth Meeting of Session 1848-49. March 27, 1849.

Dr. Addison, President, in the Chair.

Case of Cervical Paraplegia in an Infant. By Henry Davies, M.D., Physician to the British Lying-in Hospital, etc. Eliza A. B——, aged twelve months and a half, had been weaned three months, without trouble, and had cut the two lower central incisors. On the 17th of November she had been particularly lively all the day, had taken her usual exercise, and was put into her bed, in the evening, apparently in good health. When the nurse went to bed she appeared restless, and crawled into the nurse's bed from her own, which was close beside it. At five o'clock in the morning she sat up in bed, and ate a finger-biscuit. At half-past five she uttered a peculiar cry, for which some Dalby's carminative was given, without relief. The child shivered slightly. At six o'clock she was put into a warm-bath, and had a dose of castor-oil. At eight o'clock she took a basin of bread-and-milk. At ten o'clock she was violently sick, turned cold, and looked blue about the mouth, nose, and eyes. She was now put into a second warm bath, when she appeared to lose the entire use of her limbs, and her countenance became vacant. From this time she lay prostrate. When seen by the author, on the evening of the 18th of November, she was perfectly conscious, her head was cool, and the temperature of the surface generally natural, the pupils contracting under the influence of light ; pulse moderately frequent, small and languid ; tongue slightly coated. The upper extremities were devoid of all power of motion or sensation, even from pinching or pricking with a pin ; but the lower extremities were drawn up on the feet being tickled. Nothing unnatural was detected in the course of the spinal column, or any other part. Two leeches had been applied behind the ears ; a blister was put between the shoulders ; aperients and a saline mixture, with ammonia, were given. During the five weeks that the child lived, no change took place in the paralytic symptoms, and she remained perfectly conscious to within a few hours of her death. She was much weakened by diarrhœa, which set in on the 9th of December ; and from that time she became emaciated, and was restless and feverish, while the lateral incisors came through the gums. During the five weeks, she cut six teeth. The body was examined twenty-four hours after death. The dura mater, as well as a portion of the brain, was torn in opening the head, and about an ounce and a half of sanguineous fluid escaped. The vessels on the surface of the brain were some-

what fuller than natural; the cerebrum itself healthy; the cerebellum and medulla oblongata, as well as the nerves at the base, were particularly firm. The medulla spinalis was equally firm, its investing membrane tough, and vessels tinged. There was no fluid in the ventricles of the brain, and no lesion was discovered either in the brain or in the spinal chord. The viscera of the thorax and abdomen were generally healthy in appearance. The author remarked, that paralysis, coming on suddenly, not preceded or accompanied by any apparent disease of the brain, is by no means uncommon in children between the first and tenth year. In all cases, he believed, the predisposing cause was the process of dentition; the exciting cause has, in the majority of cases, appeared to be some derangement of the digestive organs. But in the case now related, which is peculiar, from the sense of feeling, as well as the power of motion, being lost, he believed the exciting cause was the succession of shocks received by the spinal chord, through the use of a baby-jumper. He adduced some arguments and quotations from authors in support of his opinion; and, in an appendix, gave a brief account of four other cases of paralysis in children.

Dr. M. Hall.—The author had evidently felt all the difficulty, as well as all the importance, of an accurate diagnosis in cases of paralysis; and the question had for many years been an object of special investigation with himself. He would endeavour very briefly to state to the Society some of the conclusions at which he had been enabled to arrive. Besides hemiplegia and paraplegia, there are cases of partial paralysis, arising from the affection of the nerve of the part itself,—an affection most frequently seen in the face. But all cases of *partial* paralysis are not affections of this nerve merely; for we may have partial hemiplegia, hemiplegia *limited* to the eyelid, to the face, to the arm, to the leg, etc. We may also, he believed, have partial paraplegia, or paraplegia limited to an arm or leg; though of this he was not so certain. This remark led him to the case before the Society,—a case of paralysis of the two arms, and, as he understood, of the two arms only, the legs being unaffected. What could its nature have been? There are two cases, one of which the given case may have been: the first is effusion at the base of the brain, slowly encroaching on the spinal canal, and compressing the roots of each brachial plexus. But this case is slow in its accession, and the case before us was more or less sudden. The second is of a totally different character. Sudden attacks of paralysis of an arm, of a leg, or of both arm and leg of the same side, in children, are not very uncommon. They are generally preceded or accompanied by spasmodic or convulsive affection. He thought they were to be traced to dental, gastric, or intestinal irritation, acting, in a reflex manner, on the muscular system, and especially on the muscles of the neck, whence the veins of this region became compressed, and the nervous centres congested with blood, and there were coma and general convulsion. If such a state of things may occasionally leave one arm paralysed, it seems not difficult to imagine, that in rare cases, both arms may suffer the same loss of power.

Cases of perforation and other Lesions of the Stomach, occurring in connexion with Diabetes Mellitus; with Observations on the Gastric Origin of that Disease. By William Macintyre, M.D., Physician to the Western General Dispensary, Lisson-grove. The author commenced his paper with some general introductory remarks, on the unsatisfactory results of anatomical researches in diabetes. He then proceeded to relate three fatal examples of the disease which fell under his own immediate observation, and in which post-mortem appearances were met with in the stomach, strongly significant of that organ having been, at some period, subjected to a special morbid action. The first case was that of an adult male, in whom the disease was not recognised till about a year before the author was consulted. The symptoms were highly characteristic. Death took place

under a state of obstinate constipation. On a post-mortem inspection, among other lesions, the left upper lobe of the lungs was found broken down in its centre into a softened purulent mass, more like the disorganisation from unhealthy inflammation, than a tubercular vomica. The stomach was greatly dilated, and its walls very thin; its cardiac extremity presented a dark appearance, and its lining membrane was softened. The blood-vessels of this viscus were unusually large and turgid. The kidneys were much enlarged, and double their ordinary weight. The right freely admitted a wax injection; the left exhibited, under the microscope, the natural structure. The subject of the second case was also an adult male. He had been getting thin and weak for some months before he was seen by the author, and died, labouring under an extensive aphthous affection of the mouth and fauces, accompanied with symptoms of intense irritation of the stomach, pain at the epigastrium, eager craving for cold drinks, and incessant vomiting. The real nature of the complaint was not detected till two days before death, when the urine was found to be profuse, limpid, of specific gravity 1038°, and strongly saccharine. On inspection, the organ presenting the principal lesions was the stomach, which was remarkably capacious, and on being lifted up for examination gave way posteriorly at its large curvature, allowing the escape of a dark-coloured fluid into the abdominal cavity. Its walls around the rent thus caused were very soft, and throughout the entire splenic division were reduced to extreme tenuity, being in some places almost diaphanous. The subject of the third case was a little girl, only five years old, who had been for some weeks under treatment in the country, for what appeared to be remittent fever, and was brought to town for advice, when the urine was found to be very copious, of great density, the specific gravity ranging between 1040° and 1045°, and abounding with sugar. The constitutional symptoms corresponded with the character of the urine, and the child sank rapidly, and died exhausted. On dissection, an unusual dryness of all the tissues was observed. The kidneys appeared to be perfectly sound. No tubercles could be discovered in the lungs, but a coffee-coloured fluid, to the amount of several ounces, occupied the lower part of the pleural sac. When this fluid was removed, the cavity of the chest was seen to communicate with the stomach by one large irregular hole in the walls of that viscus, and several smaller perforations in the diaphragm. The openings in both corresponded exactly, but without any adhesion between the opposed surfaces. The structures bordering on the perforation were black, ragged, and thin, and the parietes of the stomach, throughout its whole splenic division, partook more or less of this attenuation. The fluid removed from the chest was inodorous, and found to consist chiefly of blood, epithelium, and textural detritus. In considering the nature and import of the changes observed in the stomach, the great question to be solved is, whether they are to be regarded as pathological lesions, or cadaveric changes. As respects the actual perforations in the last case, the author considers them to be post-mortem consequences, and analogous to those changes which, since Hunter's time, have been noticed to occur in connexion with various diseases, some of decidedly gastric character, but the greater number not primarily referable to the stomach. The facts thus brought into notice would seem to lead us to take a modified view of the theory of solution, and regard the successive changes from softening to attenuation, and from attenuation to complete loss of substance, as the work, not of a gastric secretion in a normal and healthy state, but as the effects either of that fluid in an altered or vitiated state, or of other products secreted by, or generated in, the stomach, and endowed with corrosive properties which do not come into full play till after death, when the tissues are already enfeebled and wasted, and no longer defended by the vital forces. In diabetes, the sugar existing in the primæ viæ suggests a fertile source of products possessing most active qualities. Those which we are most acquainted with are the lactic and oxalic acids, both of them hostile to the constitution.

MISCELLANEOUS INTELLIGENCE.

Resignation of Dr. Charles J. B. Williams. Dr. Williams has resigned his Professorship of Medicine in University College, and also his appointment as Physician to the Hospital. His successor is not yet nominated. Drs. Garrod and Parkes, in the mean time, take charge of the Hospital wards.

The Cholera at Tooting:—Mr. Drouett. At page 214 of our Number for February, we gave a short account of the terrible cholera mortality in Mr. Drouett's receptacle for pauper children. Mr Drouett has been tried for manslaughter, and acquitted.

St. George's Hospital. On Friday, March 30, the pupils of the Anatomical School of St. George's Hospital presented Prescott G. Hewett, Esq., the Assistant-Surgeon to, and Lecturer on Anatomy at that institution, with a beautiful and massive silver salver, as a testimonial of their respect and gratitude for his unremitting exertions in promoting their professional studies.

Medical Reform Tax. The *Lancet* (April 21) says that some medical reformers desire that a tax of £21,787: 10s. shall be levied on one thousand, one hundred, and fifty of the Doctors of Medicine now practising in England and Wales! Of this sum, it is proposed that the College of Physicians receive £16,537: 10s. It is also said, that gentlemen who either cannot pay, or do not wish to pay, the fines, may still be legal practitioners, under the proposed new law, by abandoning the title of Doctor (!) and joining the new college, which is to come in place of the Apothecaries' Society. Of the 1,150 doctors above referred to, 450 are Edinburgh graduates.

Meeting at the South Staffordshire General Hospital. The gentlemen who attended the meeting, were Dr. Topham, Mr. John Fowke, Mr. Dehane, Mr. Edwardes, Mr. Cartwright, Mr. Coleman, Mr. Dunn, Dr. Bell, Mr. Cooper, Mr. Gates, Mr. C. Underhill, Mr. Haslehurst, Mr. Grundy, Mr. Johnson, Mr. Campbell, Mr. Wright, Mr. Pope, Mr. Oakley, and Mr. Bunch. These gentlemen unanimously condemned the institution of the new "College of General Practitioners" as injurious to the interests of the public, and degrading to the general practitioner.

Medical Reform Excitement. Memorials against the measure promoted by the London Corporation and "National Institute" have been numerously subscribed at Manchester, Cheltenham, and other places. It is quite evident from the renewed and augmenting excitement on the subject of Medical Reform, that the only hope of a good measure being carried, is for the Government and the Legislature to decide on what is best for the public and the profession, and then make that law without reference to private interests, or cabals.

New Lunatic Asylum for Middlesex. At a meeting of magistrates last week, a mortgage was executed on the County rate for £23,000 for the new Asylum at Colney Hatch.

Testimonial to John Fowke, Esq. This gentleman having resigned his connexion with the Wolverhampton Dispensary, to which he had been Surgeon for fifteen years, has been presented by the inhabitants of the town and neighbourhood, with a silver salver value £50, on which was placed for his acceptance the handsome sum of £1,508.

Berzelius. The Academy of Sciences of Stockholm, at its recent anniversary meeting, wore mourning in token of respect for the memory of this illustrious chemist. The King was among the members present. The widow of Berzelius has gifted his library and laboratory to the Academy.

APPOINTMENTS.

Brown, C. B., M.D., elected Physician-accoucheur to Queen Charlotte's Lying in Hospital.

Critchets, George, Esq., F.R.C.S Eng., formerly Assistant-surgeon, was (on the resignation of John Dalrymple, Esq.) appointed, on the 2nd April, Surgeon to the Royal London Ophthalmic Hospital.

Guthrie, Mr., has been appointed Consulting-surgeon to the Westminster Hospital, vacant by the death of Mr. A. White.

OBITUARY.

Bond, John, Esq., Surgeon, at Nuneaton, Warwickshire, on 10th April, aged 78.

Blair, Michael, Esq., at Kildysart, Ireland, of cholera, on the 7th April.

Blandin, Professor, Paris, in the fiftieth year of his age, on the 17th April. He was Professor to the Faculty, for Operations and Surgical apparatus; and was the author of several well-known and valuable works.

Coley, John, Esq., jun., Surgeon, at Bridgenorth, of apoplexy, aged 40.

Down, John Sommers, Esq., M.D. Edin., aged 65, at his residence, Ilfracombe, Devon, on the 19th March.

Dunn, Edward, Esq. (of Ulverston), Surgeon, aged 30, youngest son of the late John Dunn, Esq. of Durham, at Liverpool, on the 1st April.

Gardner, George, M.D., Superintendent of the Botanical Garden, Peradenia, Kandy, Ceylon, at the Governor's house, Neuri Ellia, Ceylon, suddenly of apoplexy, on the 10th of March. The deceased was an indefatigable naturalist; and well known as the author of "Travels in the Interior of Brazil."

Harvey, Robert, Esq., Surgeon, at Oulart, Ireland, of malignant fever, caught in the discharge of his duty under the Board of Health, on the 19th March.

Jey, Robert, Esq., Surgeon, aged 88, at Queen Camel, Somerset, where he had practised for upwards of sixty years, on the 16th of January.

Locke, Robert, M.D., at Rathkeale, Ireland, of cholera, on the 7th April.

Mullin, James, M.D., at New Ross, of cholera, on the 7th April, aged 56.

Russ, Edward, Esq., Surgeon (late of Castle Cary, Somerset, and formerly of Wolverhampton), at Graham's Town, Cape of Good Hope, on 17th January, aged 33.

Serre, M., Professor of Clinical Surgery in the University of Montpellier, of apoplexy, in his 49th year, lately.

Walsh, Muns, Esq., M.D., at Coote Hill, of fever, caught in the discharge of his duty as Medical Attendant of the Fever Hospital and Dispensary, lately.

Warren, Robert, M.D., at Kinsale, of fever, on 7th April.

Yonge, Walter, Esq., M.D., aged 24, at Clapham, Surrey, only son of Walter Yonge, Esq., Surgeon, St. Ives, Cornwall, on 15th March.

BOOKS RECEIVED.

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